PROCEEDINGS

OF

THE SUB-COMMITTEE,

PUBLIC SERVICE COMMISSION.

PUBLIC WORKS DEPARTMENT,

INDIA.

CALCUTTA:
PRINTED BY THE SUPERINTENDENT OF GOVERNMENT PRINTING, INDIA.
1868.

CONTENTS.

		PAGE
Sec. I.—	Note by the Sub-Committee	1
Sec. II.—	Information supplied by the Government of India in the Public Works Department	31
,,	Schedule of the classes and grades of the several establishments of the Public Works Department, with the rates of pay of each	43
,,	Rules relating to the examination of Assistant Engineers	44
,,	Tabular statement showing existing organization and constitution of the Public Works Department of India	45
,,	Information supplied by the Local Government, North-Western Provinces and Oudh	48
,,	Tabular statement showing the existing organization and constitution of the Public Works Department, North-Western Provinces and Oudh	51
,,	Note by the Acting Secretary to the Government of Bombay, Public Works Department	53
,,	Note by the Departmental Member, Madras Sub-Committee, on the subject of the more extensive employment of Natives of India in the Madras Public Works Department	54
Sec. III.—	SITTINGS AT CALCUTTA—	
,,	Witness No. I.—Major G. F. O. Boughey, R.E., Manager, Eastern Bengal State Railway	56
,,	,, No. II.—W. Nicholson, Esq., C.E., Superintendent of Ways and Works, Eastern Bengal State Railway	57
,,	,, No. III.—P. D. Barclay, Esq., Traffic Superintendent, Eastern Bengal State Railway	58
,,	,, No. IV.—S. Finney, Esq., Assistant Manager, Eastern Bengal State Railway	*ib.*
,,	,, No. V.—E. P. Quinlan, Esq., Examiner of Accounts, Eastern Bengal State Railway	59
,,	,, No. VI.—J. B. Braddon, Esq., Examiner of Accounts, Public Works Department	60
,,	,, No. VII.—W. B. Bestic, Esq., C.E., Junior Secretary to the Government of Bengal, Public Works Department (Roads and Buildings)	62
,,	,, No. VIII.—J. Wilcocks, Esq., Assistant Engineer, Public Works Department	63
,,	,, No. IX.—F. J. E. Spring, Esq., Under-Secretary, Government of Bengal, Public Works Department, and Assistant Chief Engineer, Bengal Railway Branch	64
,,	,, No. X.—Lala Ralla Ram, Honorary Assistant Examiner	67
,,	,, No. XI.—C. W. Odling, Esq., M.E., Superintending Engineer, Irrigation Branch	68
,,	,, No. XII.—T. Deveria, Esq., of the firm of Marillier and Edwards	70
,,	,, No. XIII.—A. W. Rendell, Esq., Locomotive Superintendent, Eastern Bengal State Railway	71
,,	,, No. XIV.—Babu Khetter Prasad Mukerji, Executive Engineer and District Engineer, 24-Pergunnahs	72
,,	,, No. XV.—J. H. Toogood, Esq., 2nd grade Executive Engineer	74
,,	,, No. XVI.—Babu Khetra Nath Bhattacharjea	75
,,	,, No. XVII.—Babu Khetter Mohun Bose, late Executive Engineer	76
,,	,, No. XVIII.—Rai Sahib Bama Churn Paramanic, Honorary Assistant Engineer	77
,,	,, No. XIX.—Babu Madhub Chunder Roy, Executive Engineer, 2nd grade	78
,,	,, No. XX.—Babu Kheder Nath Chatterjee, Executive Engineer, 2nd grade	79
,,	SITTINGS AT ALLAHABAD—	
,,	Witness No. XXI.—Colonel Edmund Swetenham, C.E., B.S.C., Superintending Engineer, Allahabad Circle	80
,,	,, No. XXII.—Major F. V. Corbett, R.E., Executive Engineer, 1st grade, Irrigation Branch, Agra	82
,,	,, No. XXIII.—A. Grant, Esq., C.E., Executive Engineer, Irrigation Branch, Personal Assistant to the Chief Engineer	83
,,	,, No. XXIV.—W. C. Wright, Esq., C.E., Executive Engineer, Lucknow Division	84
,,	,, No. XXV.—F. T. Atkins, Esq., President, United Railway and Government Servants' Association, &c.	85
,,	SITTINGS AT LAHORE—	
,,	Witness No. XXVI.—Major J. W. Ottley, R.E., Superintending Engineer, Irrigation Branch, Public Works Department, Punjab	86
,,	,, No. XXVII.—R. Bradley, Esq., Executive Engineer, 2nd grade, Irrigation Branch	88
,,	,, No. XXVIII.—T. Higham, Esq., Superintending Engineer, 3rd class, Irrigation Branch	89

MEMBERS OF THE SUB-COMMITTEE.

BENGAL.

*The Hon'ble Romesh Chunder Mitter, B.L.
The Hon'ble J. W. Quinton, C.S., C.S.I.
The Hon'ble Maulvi Abdul Jubbar.
W. H. Ryland, Esq.
The Hon'ble Colonel E. Trevor, R.E., *Departmental Member.*
Sir Charles A. Turner, Kt., C.I.E., *President.*

N.-W. P. & OUDH.

The Hon'ble J. W. Quinton, C.S., C.S.I.
Joshua Clarke, Esq.
Colonel A. M. Lang, R.E., *Departmental Member.*
Sir Charles A. Turner, Kt., C.I.E., *President.*

PANJAB.

The Hon'ble J. W. Quinton, C.S., C.S.I.
Lieutenant-Colonel F. J. Home, R.E., *Departmental Member.*
Sir Charles A. Turner, Kt., C.I.E.

SIMLA.

The Hon'ble J. W. Quinton, C.S., C.S.I.
Colonel R. C. Pemberton, R.E., *Departmental Member.*
Sir Charles A. Turner, Kt., C.I.E., *President.*

BOMBAY.

*The Hon'ble J. W. Quinton, C.S., C.S.I.
The Hon'ble Khan Bahadur Kazi Shahbudin, C.I.E.
Rao Bahadur Krishnaji Lakhsman Nulkar.
J. F. Fernandez, Esq.
W. S. Howard, Esq., C.E., *Departmental Member.*
Sir Charles A. Turner, Kt., C.I.E., *President.*

MADRAS.

*The Hon'ble J. W. Quinton, C.S., C.S.I.
Salem Ramaswami Mudaliyar, Esq., B.L.
Khan Bahadur Mohamed Ishaq.
D. S. White, Esq.
Captain W. C. Baddeley, R.E., *Departmental Member.*
Sir Charles A. Turner, Kt., C.I.E., *President.*

* Unable to attend.

PROCEEDINGS

OF THE

SUB-COMMITTEE,

PUBLIC SERVICE COMMISSION.

INDIA.

Public Works Department.

Section I.—Note by the Sub-Committee.

The work of the Department is divided among the following branches:—

(*a*) General Branch.
(*b*) State Railways,
(*c*) Accounts.

The General Branch is subdivided into two branches, (1) Roads and Buildings Branch, in which in Bombay and Madras Military Works are included, and (2) Irrigation Branch.

The officers of the Department are classified as belonging to the Government Secretariat, the Engineering, the Accounts, and the State Railway Revenue Establishments.

Nine officers are employed in the Secretariat of the Government of India and Local Governments charged with duties not purely clerical, on salaries ranging from ₹500 to ₹2,500. Seven of these officers are Europeans not domiciled in India, one is a domiciled European, and one is a Hindu. The Secretary to the Government of India, if a Royal Engineer, draws staff pay, in addition to the salary of the appointment, which brings his allowances up to above ₹3,500.

Engineering Establishment.

The Engineering Establishment is made up of—

Engineers,
Upper Subordinates,
Lower Subordinates.

The last named are not referred to in this note, as they draw salaries under ₹100. Engineers are classified as—

(1) Assistant Engineers in three grades, carrying salaries of ₹250, ₹350, and ₹500. Those of the 2nd grade, after 3 years' service in the grade, receive ₹400 if recommended.
(2) Executive Engineers in four grades, with salaries of ₹600, ₹700, ₹800, and ₹950.
(3) Superintending Engineers in three classes, with salaries of ₹1,100, ₹1,350, and ₹1,600.
(4) Chief Engineers in three classes, with salaries of ₹1,800, ₹2,000, and ₹2,500.

The present Establishment of Engineers is 1,015 in number and is made up of the following classes of officers:—

Royal Engineers	191
Other Military Officers	22
Civil Engineers appointed in Europe	473
" " " in India	329
	1,015

The Military Works Branch in Bengal is not under the Public Works Department as in Madras and Bombay, but is officered from the Public Works Department Engineer Establishment, and absorbs 76 officers, all Royal Engineers or other Military officers.

The races represented in the superior Engineer Establishment are as follows:—

Europeans not domiciled in India (or about 80 per cent. of the whole)		810
Europeans domiciled in India, including Eurasians		119
* Natives of India of unmixed blood		86
Hindus	80	
Mahomedans	2	
Others	4	

* State Railways 12
Bengal . . 12
North-Western Provinces . 11
Punjab . . 12
Bombay . . 17
Madras . . 6
Minor Administrations . 16
86

It was found impossible to obtain such accurate information as would warrant a separate classification of Eurasians and Europeans domiciled in India.

The Engineers form a close service, and admissions to it are obtained only from the Corps of Royal Engineers on the Indian establishments, or from passed students of the Royal Indian Engineering College at Cooper's Hill, or of the Indian Engineering Colleges. The present annual recruitment is fixed at 30, representing an ultimate strength of 800 men, and is distributed under the orders of the Secretary of State as follows:—

Royal Engineer Subalterns	6	
Royal Indian Engineering College, Cooper's Hill	15	
Thomason College, Rurki (North-Western Provinces)	4 & 5	alternately.
Seebpore College, Calcutta	2 & 1	"
Indian Civil Engineering College	1	
Poona College of Science	2	

If this system of recruitment be adhered to, the Public Works Department Engineers would ultimately be—

One-fifth from Royal Engineers,
Half from Cooper's Hill Royal Engineering College,
Three-tenths from Indian Engineering Colleges.

Royal Engineer officers of higher rank than Subalterns are also admitted into the superior offices, but such admissions are compensated by the reversion to military duty of officers of similar rank.

Appointments from sources other than these can only be made with the sanction of the Secretary of State and have practically ceased. They would be recommended only under the most exceptional circumstances.

Royal Engineer Subalterns and students from Cooper's Hill are generally on first joining appointed as Assistant Engineers of the 2nd grade, salary ₹350 rising to ₹400 after 3 years' approved service. Students from the Indian Colleges join as Apprentices on a salary of ₹100, and if qualified may be promoted after six months to the 3rd grade of Assistant Engineers on ₹250.

The salaries of the different grades of Engineers already given are consolidated salaries for civilians. Military officers draw in addition to them their net military pay or in lieu of them what is known as the staff scale with military pay and allowances. During the period of service leave and furlough are obtainable under the rules applicable to different classes of officers. Royal Engineers and Civil Engineers appointed in England enjoy practically the most favorable furlough rules, with a difference in favor of Royal Engineers as regards the amount of furlough allowances and the total amount of special leave and furlough combined. Other officers of the Department are subject generally to the leave rules of the Uncovenanted Service. All officers of the Department must retire at the age of 55, on the pension to which they are entitled. An officer, who on reaching the age of 50 has not attained the rank of Superintending Engineer, is liable to be called on to retire if a Civil Engineer, or to vacate his appointment if a military officer when he would revert to military duty. Pensions in the case of Royal Engineers and other military men are regulated by the rules of the service to which they belong. Civil Engineers professionally trained in England, including those who came out under covenant with the Secretary of State and from the Cooper's Hill College, are entitled, under existing rules, to the benefit of a graduated scale of pensions on medical certificate, after periods of service from 10 to 20 years, and without medical certificate after 20 and 25 years' service, subject to a maximum in the former case of ₹4,000 and in the latter of ₹5,000. Additional pensions of ₹2,000 and ₹1,000 are also authorized for approved service to officers of the grade of Chief or Superintending Engineer. Furlough for 2 years in 20 of service, 3 in 25, 4 in 30, and 5 in 35, counts as pensionable service. Pension is obtainable by the other classes of Civil Engineers trained and appointed in India under the Uncovenanted Pension rules, under which no leave, except privilege leave, counts as pensionable service, and the maximum pension is ₹4,000, except for officers who, for five years before retirement, have drawn an income of more than ₹12,000 per annum when the maximum is ₹5,000. In case of such officers, obtained from other sources than the Indian Colleges, no service before 22 years of age counts for pension as they are supposed to have entered the Department young and to have got their technical training in it. A Provident Fund was established in 1884, to which all Civil Engineers and members of the superior Accounts Branch, who entered the service since that date, are compelled to subscribe. All officers of those classes who were in the service at that time may subscribe if they choose. The benefits of the Fund are in addition to the prospective right to pension.

Recruitment of Engineers and large employment of Natives.

The total number of Engineers to be annually recruited, and the proportions of that number assigned to different sources of supply, were fixed by the Secretary of State for India in a Despatch, dated the 30th October 1884, which concluded a lengthy correspondence on the subject, extending over several years with the Government of India. Copies of this correspondence have been furnished to the Members of the Commission in the volume entitled "A collection of papers relating to the reservation of Engineer appointments in India to pure Natives."

For many years previous to 1872 Engineers for the Public Works Department were furnished from the Corps of Royal Engineers, from Civil Engineers appointed in England, after a competitive examination or special selection, and from passed students of the local Indian Engineering Colleges. The Thomason College at Rurki, which was established in 1847, began to furnish Engineers to the Department in 1850. The Poona Civil Engineering College, established in 1854 for the education of subordinates for the Bombay Public Works Department, developed into the Poona College of Science in 1865, which is affiliated with the Bombay University and educates for the Engineering degree of L.C.E. The Madras Civil Engineering College, affiliated to the University in 1877, also educates for Engineering degrees of that University. In 1870 the Royal Indian Engineering College at Cooper's Hill was established with a view to the education of Civil Engineers for the service of Government in the Indian Public Works Department. From the time when students began to pass out from the Colleges in adequate numbers in 1873 and 1874, recruitment of Civil Engineers by competition in England gradually ceased.

About this time successive Secretaries of State were urging on the Government of India the more extensive employment of Natives in all branches of the Administration, and in 1876 Lord Salisbury wrote as follows in a Despatch respecting the adjustment of a supply of Civil Engineers from different sources for the Public Works Department:—"The recruiting of the European portion of the superior Public Works establishments having now been provided for through the College at Cooper's Hill, the Indian Engineering Colleges may properly be more closely limited to meet the wants of the Natives of India. Without going so far as to say that the higher classes of these colleges should be closed to persons of European parentage, I have no difficulty in adopting the conclusion that the education of such students should, as far as possible, be made self-supporting if this is not already the case, and that the guarantee of appointments in the public service should in future be wholly reserved to such students as are Natives of India." The matter was considered at some length by the Government of India, but no immediate action was taken. In 1879, Lord Cranbrook recurred to the subject and speaking of the Rurki College remarked: "I have also observed with regret that, from whatever reason, the operation of the Thomason College has been to add to the strength of the Europeans in the Department rather than to increase the proportion of its Native members." The Government of India in reply pointed out that the large number of English Engineers in the Department and annually arriving all but excluded Natives from a career in the Public Works Department and precluded the Government of India from redeeming to the utmost extent the pledges of Her Majesty's Government to employ Natives in the several Departments of the service of the State. It, therefore, recommended that the supply of Engineers from Cooper's Hill should be reduced, and that a general College of Engineering for the training of Natives should be established for India. Lord Cranbrook disapproved of these proposals and maintained that the operation of the Thomason College had been a far more serious bar to the employment of Natives than had been the necessity of providing for men sent out from England. The subject was again fully discussed in India, and while it was still under consideration larger reductions were made in 1879 in the Engineering Establishment. Nearly three hundred officers were retired, in consequence of which the Government of India recommended the closing of the Royal Indian Engineering College at Cooper's Hill, which was not assented to by the Secretary of State, and in the same year orders were issued restricting the appointment of any person not a Native of India within the meaning of Section 6, 33 Vic., Cap. 3,* to appointments carrying a salary of R200 or upwards, without the sanction of the Governor General in Council in each case. Certain Departments were excluded from the operation of these orders, of which the Public Works Department was one. The Governor General in Council did not wish that offices in these Departments should be in any way reserved for Europeans, and was glad to see that in the Public Works Department in Bengal the Lieutenant-Governor had decided that Natives should be employed more largely than heretofore.

In 1882 the question respecting guaranteed appointments from the Thomason College at Rurki was reported on. The Government of India discussed the question in a Despatch to the Secretary of State. It came to the conclusion that by "Natives of India" the Secretary of State, notwithstanding the Statutory definition, had meant persons of Asiatic origin rather than persons of European or mixed blood. It pointed out that, although students of Asiatic origin enjoyed exceptional advantages at the College, owing to the existence of scholarships for which they alone were eligible, their number had been insignificant, and proposed (*a*) to lower the educational standard required for entrance to the College from a B.A. degree to a pass in the First Arts examination of an Indian University; (*b*) to declare eligible for guaranteed appointments in the Public Works Department, after May 1883, only candidates of pure Asiatic blood. The Secretary of State, while giving sanction to these proposals, remarked: "I should be disposed, however, to look upon the measure as an experiment. If it should in any way fail to produce the desired effect, and the exclusiveness established should not operate for the advantage of the service, a change will have to be made in the direction of allowing young men of European parentage to enter the lists with the Asiatic student. . . . . I understand it

* "For the purpose of this Act the words 'Natives of India' shall include any person born and domiciled within the dominions of Her Majesty in India of parents habitually resident in India and not established there for temporary purposes only."

to be meant that Native students passing a full test at the final examination shall be entitled to guaranteed appointments in order of merit; but that if a sufficient number do not pass the test, the appointments not gained by Natives will be open to the European competitors, who will be placed according to their order of merit on the whole list of those winning appointments. It is hardly necessary to observe that the test of qualification must be pitched high enough to secure that those Natives who do obtain appointments are well qualified, so far as this can be tested by examination."

Orders in accordance with these principles were issued by the Government of India. The issue of the Resolution containing these orders was received with consternation by the Anglo-Indian and Eurasian communities and by the educational institutions frequented by the sons of men belonging to those classes. Memorials poured in upon the Government of India, which felt constrained to reopen the question. This was done by a Despatch to the Secretary of State in 1883. The Government of India felt that the adoption of a definition of "Native of India" for the Department of Public Works differing from that prescribed by an Act of Parliament, and followed in other branches of the public service, could scarcely be justified, and that the effect of the orders complained of might be to close the profession of Civil Engineers to domiciled Europeans and Eurasians by reducing the inducements to those classes to pursue a course of Engineering study. It, therefore, recommended that the annual recruitment for the Engineer Establishment should be fixed at 34, and that one-third or 11 of these should be reserved for students of Indian Colleges. All Natives of India in the Statutory sense of the term were to be eligible to compete for them, it being at the same time understood that all persons admitted in this manner to the service should enjoy one set of rules in regard to pay, leave, and pension. The provision reducing the preliminary qualifications for entrance to the Thomason College from a B.A. to a pass in the First Arts was to be maintained. These proposals did not at first commend themselves to the Secretary of State, and the only modification of his decision to which he acceded was that half the number of appointments instead of all should be reserved for pure Natives who might qualify by passing the necessary standard irrespective of the place held by them among the rest of the candidates. The Government of India, before carrying out these orders, asked for a reconsideration of them. It was pointed out that there would be great practical difficulty in carrying them into effect in any way compatible with the principle of competitive examination, and that in the Madras, Bombay, and Bengal Colleges, where only a single appointment was to be made annually, the only method of doing so was to have a restricted and even open competition in alternate years. On the other hand, it was pointed out that special arrangements appeared necessary only as regards the Thomason College, for the statistics of the Public Works Department showed that except at Rurki Natives from the other Indian Colleges had no difficulty in holding their own, and that at Rurki, since the alteration in the qualifying standard for the preliminary examination, the disabilities under which they laboured had been entirely removed. To these representations the Secretary of State yielded and wrote that he was not disposed to insist on the maintenance of a distinction which may cause certain disadvantages both to individuals and to the service, and after some further correspondence respecting the numbers for the annual recruitment they were fixed by the Secretary of State at those already stated for 1885, 1886, and 1887, *viz.*, 30, of which 9 were to be taken from Indian Colleges, 15 from the Royal Indian Engineering College, Cooper's Hill, and 6 from the Royal Engineers. The nine appointments to be filled up from the Indian Engineering Colleges were distributed by the Government of India as follows:—

Thomason College, Rurki	4 and 5 alternately.
Seebpore (Calcutta)	2 and 1 „
Madras Civil Engineering College	1
Poona College of Science	2

With reference to the remarks of the Government of India in 1884 respecting the result of removing the disabilities of Natives for the Rurki Entrance examination, the following information is given in the Calendar of the Thomason College for 1887. In 1884, Natives held the first and third places out of nine students in the Engineering class. In 1885, a Native was third out of four students. In 1886, Natives were 1st, 2nd, 3rd, 6th, and 8th out of a class of nine, and the highest placed student of the Engineer class, second year, in the year just past, is a Hindu, who has alone obtained the higher certificate as Assistant Engineer.

The orders have also borne fruit as regards the larger admission of Natives, for 66 of the 86 Natives in the Engineers are in the grade of Assistant Engineers or Apprentices, showing the increasing number of Natives that are now joining the Department of Public Works.

Upper Subordinate Establishment.

The upper subordinate grades of the Engineering Establishment may be divided into three classes:—

Local lists under the Government of India,
The Madras List, and
The Bombay List.

The officers on these lists are classified into three grades of Overseers on salaries of R60, R80, and R100, two of Supervisors on R150 and R200, three of Sub-Engineers on R250, R300, and R400. British soldiers in these grades draw a military and staff salary, not less in the aggregate

than the consolidated salaries given above. European Sub-Engineers of the 1st grade, after five years' service with the grade, may secure for especially good service an increment of R5 per mensem, and a second increment of the same amount after ten years' such service. These lists are primarily recruited from European soldiers and European and Native Civilians who go through a two years' course of theoretical training in the Thomason or Madras Engineering College, and after passing their examination successfully are sent for one year of practical training as Apprentices on large works. The annual number recruited for the Government of India is now fixed at 26. Those for Madras and Bombay may be assumed to be 4 and 5 respectively. If the supply from the Colleges is deficient in any year, vacancies may be filled up by the Local Governments in several ways—by appointing passed students of the Seebpore College, Howrah, or soldiers or civilians direct who can pass an educational and professional test, or by appointing men who have a thorough practical knowledge and experience in any useful branch of Engineering without a theoretical test. The men appointed by this last method are generally lower subordinates who have distinguished themselves by useful practical work, and a fair number of such appointments are made. Appointments are usually made to the grade of Overseer and promotions are made by each Local Government on its local list, the numbers on which are regulated by a scale fixed by rate.

In Bombay, where all the provisions of the Public Works Department Code are not in force, the rules for the appointment of upper subordinates are somewhat different, and will be found in the note of the Secretary to Bombay Government, Public Works Department, printed in Section II. Appointments are made primarily from Indian Civil Engineers of the University and from Royal Engineer soldiers. Three appointments are guaranteed to the former class, and appointments are made from the latter class from time to time to meet requirements at Aden and other military stations. The proportion of Natives to Europeans in each grade was last fixed in 1881, by which the numbers were equal, but this was deranged in 1884 by an order of the Government of India causing four Warrant officers to be counted against the Uncovenanted Service scale.

Europeans as a general rule enter as 1st and Natives as 3rd grade Overseers.

There are 1,098 officers in the upper subordinate grades of the Engineer Establishment belonging to different nationalities as follows:—

Hindus 532, or about 50 per cent;
Europeans domiciled in India or Eurasians 291, or 27 per cent;
Europeans not domiciled, generally British soldiers, 223, or over 20 per cent.;
Mahomedans 50.
Other Natives 2.

All the civil members of the upper subordinate branch are under the Uncovenanted Service Leave rules and no service before the age of 22 counts for pension. Military upper subordinates have a special scale of military pensions ranging from £72 to £200 per annum, in England or the Colonies; and in India from R70 to R200 a month according to the office from which the officer retired.

Technical requirements and professional attainments essential for efficient service in the various branches of the Public Works Department, and the results of local experience as to the comparative value of the service rendered by persons of various classes now employed in the Department.

For the purpose of eliciting information on these points the Sub-Committee examined, at its sittings in different places, witnesses as follows:—

Simla	7
Calcutta	20
Allahabad	5
Lahore	11
Bombay	1
Poona	9
Madras	19

The witnesses were Royal Engineers, Civil Engineers appointed in England whether by competitive examinations or from the Royal Engineering College, Cooper's Hill, Engineers appointed from the Indian Engineering Colleges, and civilians employed in the branches of the Department not calling for professional knowledge. Among these were 22 Native gentlemen. Written opinions were also received from certain officers of the Public Works Department and others, which will be found in Section IV of the Proceedings relating to this Department.

The note furnished by the Government of India states generally the technical requirements of each branch of the Department.

For the Engineering branch it refers to the course of study laid down for the Royal Indian Engineering and Thomason Colleges. This is that considered necessary in England for the training of a Civil Engineer, and is in India regarded as essential for Engineers who may be called upon to undertake works of construction in the Railway, Irrigation, and Buildings and Roads branches. It is also considered necessary for those engaged in maintenance in the two former branches, as in those branches large works of renewal are often required, and even for the mere maintenance of such important and costly works high professional knowledge and skill are essential. In the buildings and Roads branch, where the works have already been constructed, highly trained Engineers are not requisite, and for some years past it has been the policy of Government to hand over the buildings and roads of the country to the local boards for maintenance, with the aid of Engineers appointed by themselves, who are not generally superior to the best of the upper subordinate class. For any large works of renewal, such as

the reconstruction of bridges, the professional assistance of the State Engineers is always available on payment by the Boards of a certain percentage on the cost of works, and it is in many cases believed to be given without charge.

Besides the two Colleges above mentioned three other Indian Engineering Colleges supply Engineers to the Public Works Department, *viz.*:—

Seebpore College, Howrah,
Madras Civil Engineering College,
Poona College of Science,

and there are in the service many Civil Engineers appointed in England by the Secretary of State after undergoing a competitive examination. These are known generally as Stanley Engineers. As before stated, none have been appointed in this way since the establishment of the Royal Indian Engineering College at Cooper's Hill.

The following information regarding the course of study at these Colleges is taken from the calendars or from those of the Universities to which they are affiliated.

Cooper's Hill Royal Indian Engineering College.—Fifty candidates are admitted each year, after examination in English Composition and several branches of Mathematics. They must have also certificates of fair general education or undergo an examination in some classical language and in History or Geography. The course in Engineering extends over three years, and appointments, now 15, of Assistant Engineers, Public Works Department, are given to the students physically qualified for service in India in their order of standing at the Final Examination. The annual charge for each student at the College is £183. An Assistant Engineer may be required before proceeding to India to go through a course of Practical Engineering under a Civil or Mechanical Engineer. This will commonly last for a year, and the Assistant Engineer will receive during the time he is so employed £150 per annum and be eligible for a premium each half-year of £10 to £25 according to the degree of diligence and proficiency shown. When reported qualified he obtains a free passage to India and joins the Department of Public Works here as a 2nd grade Assistant Engineer on ₹350 per mensem.

Thomason College, Rurki, Engineering Class.—Candidates are admitted to this class by competitive examination. The subjects of examination are Languages, Physical Science, History, Mathematics, and Drawing. English candidates must pass in Latin, French, or German in addition to English and Hindustani which are alone required for Natives. Only those English candidates who fall within the definition of Statutory Natives are admitted. The course of study extends over two years and comprises 10 subjects; at the final examination those students who have completed their course of study and have qualified receive certificates as Assistant Engineers. A College fee of ₹10 per mensem must be paid by each English student, who will also, if not living at Rurki, be required to join the Engineer mess. Quarters are provided at a cost of ₹14 per mensem for each student. A monthly allowance of ₹100 per mensem should suffice for a student's ordinary expenses. No fee is required from any Native student of this class, but they must have sufficient funds to supply themselves with books and suitable drawing instruments, &c., &c., and to clothe themselves as Native gentlemen. Quarters are provided at a monthly rent of ₹5. For Natives in this class there are five Scholarships awarded to those who pass the most successful Entrance Examination: three of ₹50 per mensem to residents of the North-Western Provinces and Oudh or the Punjab, one of ₹40, and one of ₹35 open to all Native candidates. Four or five appointments are guaranteed to qualified students who pass the Final Examination. They join the Department as Apprentice Engineers on a salary of ₹100, and at the end of six months are eligible for appointment as Assistant Engineers, 3rd grade, on ₹250 if favorably reported on. In addition to the Assistant Engineerships, the following four prizes are guaranteed. Students to be given their choice of them in their order of standing at the Final Examination:—

(*a*) A permanent Upper Subordinate appointment, 1st grade.

(*b*) A permanent Upper Subordinate appointment, 2nd grade.

(*c*) One year's training on works under a specially selected Engineer as an Apprentice Engineer, with ₹100 per mensem and usual travelling allowances.

(*d*) Ditto ditto without salary, but with travelling allowances.

Calcutta (Seebpore) Civil Engineering College.—There are three classes—

(1) Civil Engineers,

(2) Mechanical Engineers,

(3) Foremen Mechanics (Apprentices).

For the two first there is a theoretical course of four years, and a fifth year is spent by Civil Engineer students in learning brick-making at Akra, and by Mechanical Engineer students in supervising actual work in the shops. The tuition fee for the four years of the theoretical course is ₹8 per mensem, and resident students pay, if Christians, ₹20 for messing, *plus* ₹5 for rent; if Natives, ₹7 for the former and ₹1 for the latter. For Apprentices the theoretical course is 3½ years, after which 1½ years must be spent altogether in the shops learning a trade. Europeans and Eurasians up to 25 in number pay each ₹5 per mensem, and 5 are admitted free. Natives up to ₹40 are received at ₹2 per mensem. All must be boarders. Scholarships, one of ₹20, three of ₹15 each, and six of ₹10 each, are given annually to students entering the Engineer Department tenable for two years. Two of ₹10

each, tenable for one year, are awarded on the result of the First Examination in Engineering. Two stipends of R100 and six of R50 each, tenable for one year, are granted to students who pass the best examination at the end of the fourth year, and one or two appointments to the superior grade of the Public Works Department are guaranteed to students of the College. Two stipends of R10 each and two of R6 each, tenable for 1½ years, are awarded to those Apprentices who pass the best examination, both theoretical and practical.

Civil Engineering College, Madras—has classes for—

(1) Civil Engineering,

(2) Mechanical Engineering,

(3) Engineer Subordinates,

as well as for Draughtsmen, Surveyors, and Sub-Overseers, Maistries, and Artizans. The numbers for admission to the first two classes taken together are 15 and to the third 30. Candidates for admission must produce certificates of having passed for the first two the F.A. and for the third the Entrance Examination of the Madras or some other Indian University, and must undergo open competitive examinations in Mathematics. To ensure a higher standard of general knowledge, half the marks obtained at the F.A. and Matriculation Examination are added to the total number of marks gained in Mathematics. The theoretical course for classes (1) and (2) extends over three years. This is to be followed in the case of Civil Engineers by a practical course of two years, of which one is to be spent in the Public Works Department workshop, and a second under the Public Works Department where large works are in progress. The practical course for Mechanical Engineers comprises two years of practical study at the chief workshops of the Presidency. For Engineer subordinates there is a theoretical course of two and a half years and a practical course of one year. The fees for each term of six months for classes (*a*) and (*b*) are R85, or R400 for the entire practical course. The subordinate class fees are R30 for six months or R125 for the whole theoretical course. Subsistence allowances of R50 per mensem to Europeans and Eurasians and of R25 to Natives are granted during practical course. The corresponding allowances for subordinates are R30 and R20. In both cases these are contingent on good conduct and satisfactory progress. One appointment as Assistant Engineer, 3rd grade, is given annually to the student highest on the list at the Final Examination, who has also obtained the degree of Bachelor of Civil Engineering. To those next in the list a number of Superintendentships, to be fixed by the Chief Engineer, are offered in order of merit. Vacancies in the Overseer's grade will be offered to passed men of the Engineer subordinate class in order of merit.

Poona College of Science.—Such full particulars are not available for this College as for those above referred to. It is divided into four departments—

(1) Education of Matriculated Students for University degrees in Civil Engineering,

(2) Education of Matriculated Students in Scientific Agriculture for certificates of qualification granted by the College,

(3) Education of Matriculated Students for the Forest Department which guarantees six appointments annually,

(4) Students in the workshops who wish to become Maistries, *i.e.*, Blacksmiths and Carpenters.

There are three Fellowships, one of R50 and two of R25 each per mensem, and numerous Scholarships from R25 per mensem each down to R3 awarded by open competition or to the student who has obtained highest marks at certain examinations. The Calendar for 1887-88 shows that besides three Fellowships and two Scholarships held by men who have passed the Fellowship Civil Engineering examination, Scholarships are held as follows, 5 by third-year, 9 by second-year, and 10 by first-year students.

While some witnesses say that the professional education given at all these institutions is equally good, the weight of opinion seems to be in favor of the Royal Indian Engineering College at Cooper's Hill. The professional education received there is, it is said, superior to any obtainable in India, the Professors being more able and more numerous, the range of study wider, and the opportunity for seeing the execution of large engineering works much greater. It is admitted almost on all hands that the general education of Cooper's Hill men is superior to that of Indian students, and that this, as well as their English training, gives them greater aptitude for applying their professional theoretical knowledge. Against this it is allowed that for the first three or four years of service European or Eurasian students from Indian Colleges possess a decided advantage over Cooper's Hill men by reason of their knowledge of Indian languages and greater familiarity with the habits of the people and acquaintance with the resources of the country. It is also stated that they, at least those from the Thomason College, are more amenable to discipline than the young men who come out from Cooper's Hill.

As to Native Engineers, while it is allowed that there are some brilliant exceptions, it is asserted by many witnesses that they are inferior to Europeans in force of character and capacity for dealing with men, that they shrink from responsibility, and are not to be depended on in emergencies calling for presence of mind and resource, and that they are less active, physically and mentally—defects which increase as they advance in years. Their dislike to service far from their homes—or in what are practically foreign countries, as the Punjab is to a Bengali—renders them less useful. The aptitude of educated Natives for mechanical engineering, and what may be called higher engineering, is said to be small, and while often very good executive officers on works requiring only the imitation faculty, they fail in originality and invention.

Several officers, whose opinions from their professional standing and experience appear entitled to great weight, think that the present establishment of Engineers might be much reduced by employing European Engineers for Engineering proper, and making over to Native officers, who would occupy the position of Clerks of Works in England, all work of a lower description and the ordinary construction and repairs in the Buildings and Roads branch. Most Natives obtained in the Department do not possess qualifications higher than are necessary for this description of work, which could be very well done by upper subordinates. To employ in it highly and scientifically educated Assistant and Executive Engineers is a waste of power and needless extravagance. Others would make all Natives on passing out of the Indian Engineering Colleges serve some time in the upper subordinate grades.

Promotion from that grade, as at present constituted, is disapproved of by some witnesses, on the ground that the officers in the subordinate grades are of inferior education and social standing, and would thus fail to command respect, and because men who rose through the lower grades would be too old for efficient service as Assistant Engineers. On the other hand exceptional promotions are recommended as giving a stimulus to exertion, and the bar is considered very hard on students who have obtained appointments in the upper grades as a result of the Final Examinations in the Engineering classes of the local Colleges, in which they may have missed appointment to the superior grades by only a few marks.

Several witnesses consider that Engineers from Europe should be taken, not from students of a single College, but from the general body of the profession, whereby Government would be relieved from the necessity of paying men for learning their work, while Native witnesses recommend the abolition of Cooper's Hill College on the ground of the great expense of maintaining it, and of its absorbing appointments which ought to be given to Natives of the country. There is no evidence beyond that already quoted from the Calendars to enable the Commission to compare the expenditure on the maintenance of the English and Indian Colleges, and it is questioned whether the Indian Colleges could, at all events for some time to come, supply the vacancies that must be filled if recruitment from Cooper's Hill were put an end to.

The rules as regards pay, pension, and furlough for the Engineer grade are objected to or approved of by different witnesses as a rule according to the class of officers to which they belong. Some object to any distinction in these matters between men doing the same work and belonging to the same Department. Others consider that the distinction between the pension and furlough rules of men recruited in England and in India should be maintained on the ground that a resident of a country does not require the same amount of pay, pension, and leave as a foreigner, and that the latter must get the market value of his services in the shape of higher pay or deferred pay. Civil Engineers, Stanley or Cooper's Hill, object to the uncertain value of their pensions as retarding retirement in consequence of their being paid in rupees, and Engineers appointed in this country complain that the furlough allowed them is too little and does not count as pensionable service. It does not appear that the objections taken, however sound otherwise, have materially affected the recruitment from the several classes employed in the Engineer establishment.

As regards recruitment for the subordinate grades, opinions vary somewhat as to the value of military subordinates. Some officers consider them excellent, and the North-Western Provinces canal officers are emphatic as to the value of their services in that Department. Other officers prefer Natives, or think that the employment of military subordinates away from headquarters and in wild tracts gives rise to difficulties and expense in providing them with accommodation.

The following abstract gives the substance of the evidence of each witness on these various points. The witnesses are grouped according to the branches of the department in which they are employed or have had experience:—

Brigadier-General J. Browne, R.E., *Engineer-in-Chief, Sind-Pishin State Railway; 28 years' service; employed entirely in the Punjab except a few months in the Central Provinces and at the Rurki College*,—comparing officers in the Department taken from Cooper's Hill and the Thomason College, says that the former come from higher stratum of society and have received a higher professional education; the latter carry out orders better and possess an advantage at starting in knowledge of the language. The Cooper's Hill men are more scientific, but Rurki men are better for making general arrangements not calling for strictly professional knowledge, and in dealings with the people, as in the Revenue Branch or the Irrigation Department. These remarks apply obviously only to European Engineers obtained from Rurki. General Browne expresses a very unfavorable opinion of Native Engineers and says that he has met only one who was of any real use. There are among them a few good office men, but no competent working Engineer. Natives in the subordinate grades belonging to the artizan class are in the witness's opinion excellent, but are uneducated and not to be trusted with large sums of money. He would, however, promote in exceptional cases from the subordinate grade to give a stimulus to good work. Royal Engineers should be employed on the frontier railways and roads as furnishing the best training for war service, and all Assistant Engineers should undergo a course of drudgery in the details of the different branches of work they may have to supervise. General Browne is not very favorable to the employment of military subordinates. Some are first-rate men, but they compare unfavorably with Natives on rough frontier work, when special accommodation must be provided for their families; if this is not done, they succumb to the temptations of a lonely life.

Major G. F. O. Boughey, R.E., *Manager, Eastern Bengal State Railway*, considers that though some good men are obtained from the Indian Colleges, the Cooper's Hill men are, as a class, superior. Their general education is better and the English Public school system gives greater guarantees for manliness, force of character, and administrative ability. He would employ Natives chiefly for the

lower and subordinate superintendence, and for the higher superintendence—that is, the officer class—Europeans. All the Engineering staff of the Eastern Bengal State Railway are Europeans, except one Native Assistant Engineer.

MR. S. FINNEY, C.E. (Cooper's Hill), *Assistant Manager, Eastern Bengal State Railway*—says that the best Engineers come from England. They have better general education and have had the opportunity of seeing large works.

MR. W. NICHOLSON, C.E., *Superintendent of Works, Eastern Bengal State Railway; 28 years' service, nearly all on Eastern Bengal State Railway*—has not had much experience of Engineers trained in India, Native or European. He considers that sufficient technical instruction is obtainable out here, but that the difficulty is to get competent students to apply for the appointments. They are wanting in fitness for independent positions and appear to require instructions for everything they do.

MR. F. J. E. SPRING, C.E. (Stanley); *17 years' service; Under-Secretary, and Assistant Chief Engineer, Bengal, Railway Branch; served for three years in the Punjab and then for 13½ years on Railways in the Punjab, Bombay, and Bengal*, is of opinion that as a class the Cooper's Hill men have greater knowledge of the world and are more fit to manage men than those from Rurki. They have more force of character. Has been an Examiner at the Seebpore College. The curriculum of Cooper's Hill and Seebpore is much the same. But the material from which Seebpore students are drawn is not so good, and Natives of this country are placed at a disadvantage in having to learn all they are taught through the medium of a foreign language. Native students might be made fairly good Engineers if more attention were paid at starting to their general education. They would not be as good as European Engineers, but men of tact could get equally good work out of them as out of the average Anglo-Indian. Knows two Hindu Engineers who are giving special satisfaction in Railway construction. Pay and leave ought to be governed by the market value of the different classes of officers. The average Seebpore and Rurki men would be satisfied with very much lower remuneration. The witness would employ a much larger number of Natives on smaller pay, and believes that under such an arrangement, the same men would be promoted as at present. By providing funds to benefit higher grades, it would remove much of the dissatisfaction now caused by slowness of promotion and thereby increase efficiency. Mr. Spring forwarded to the Sub-Committee a note containing a scheme for offering to the industrial classes greater opportunities than those they now possess of improving their talents and technical and artistic skill, and added the following remarks to his oral evidence:—

"I desire to add the following remarks to my evidence upon the employment of a larger number of Natives of India in the place of a proportion of our English Executive establishment.

"Much of the work which is done by the Public Works Department is of an extremely simple and elementary character, requiring less the exercise of Engineering skill than the exhibition of talents for the management and organization of labour, the collection of material and the keeping of accounts. My experience is that Natives are frequently found to possess a high degree of talent of this description, and we might, I think, as we have largely done in Bengal, relegate much of our simpler public works, such as the construction, maintenance, and repair of ordinary roads and buildings, to the graduates of our local Engineering Colleges.

"There is too great a tendency in the Public Works Department to consider all men as cast in one mould, and to expect each individual to be able, at a moment's notice, to do anything, no matter what his special experience may be, and to go anywhere without regard to racial, educational, physical, or social considerations. We know as a fact that Natives of some parts of India, especially the educated classes, have the strongest antipathy to leaving all family connections and associations and going to places which they look upon quite as much foreign territory as India appears to an Englishman. The wise administrator will utilise this characteristic of the race to the advantage of efficiency and economy by securing local men for local service in larger numbers at a lower rate of pay.

"We know from experience that there is not the same social difference between the Natives who come into the Engineering and Overseer classes of the Department that there is between Europeans in these classes, and that a Native who fails to secure an appointment in the officers' grades of the Department, after taking his University degrees, is only too glad to accept a very much lower scale of salary and social status in the subordinate ranks of the service. When placing highly trained Englishmen in charge of petty road repairs, we are cutting whetstones with razors; such work might be done perfectly well by Natives of India, and if this is admitted, we are, I think, bound to employ them more largely.

"The sincerest friend of the educated Native cannot, however, shut his eyes to the fact that, except in very exceptional cases, he is as yet, and probably for another generation or two will be, largely lacking in those qualities of courage, self-reliance, and strength of character to resist the influence of his associates, and other characteristics upon the possession of which we have for centuries prided ourselves in the Western world. For the higher appointments requiring administrative ability and conscientious integrity we must continue to principally employ Europeans. A quarter of a century of the influence of an alien system of literary education is too short a period for the radical alteration of characteristics which the influences of centuries have impressed upon a race."

Irrigation Branch.

The duties of the several officers employed in this branch are thus described by Major Corbett, R.E., an Executive Engineer and temporary Superintending Engineer, North-Western Provinces—

"The Executive Engineer is regarded as the unit in the district or division in the Irrigation Branch. He has charge either of a canal or a portion of one. He has subdivisional officers subordinate to him. They may be either Assistant Engineers or junior Executive Engineers, or upper subordinates. These Assistant Engineers or junior Executive Engineers are there, in fact, for training They are Assistants to the Engineer, and are entrusted by him with duties according to their ability and experience. Above the Executive Engineer is the Superintending Engineer. He has charge generally of from five to six divisions. The divisions vary very much in extent from one hundred to eighty miles of main canal and say five hundred miles of district bridges and perhaps fifty miles of drains. The duties of an Executive Engineer in the Irrigation Branch are first to keep the canal in repair, and make considerable extensions and improvements as may from time to time seem necessary or advisable. He has to regulate the distribution of water, which in times of drought is, of course, his chief care. In such times his is a very responsible position. He orders prosecutions on offences. Reports are made to him of any breaches of the Irrigation Code, and he sets the law in motion. The Deputy Magistrates are empowered by law to dispose of such cases, and also in an administrative sense to take up cases on their own responsibility. Ordinarily speaking, prosecutions under the Act would nearly always be instituted by the Executive Engineer. The Deputy Magistrates, of whom I am speaking, form part of the Irrigation establishment. They are at the head of what I may term, the Revenue Branch; but, of course, as Magistrates, are subordinate to the Magistrate of the district; in all other respects they are subordinate to the Executive Engineer. Their pay ranges from R200 to R400."

Colonel Robert Home, R.E., C.I.E, *Deputy Secretary to the Government of India, Public Works Department, Inspector-General of Irrigation, served since 1856 in the Irrigation Branch in the North-Western Provinces and the Punjab*, considers that the best Cooper's Hill and Rurki men are about equal. Cooper's Hill men *as a body* are superior in professional training and general education. Rurki men are more useful at first from their knowledge of the resources of the country, and language and habits of the people; but the Cooper's Hill man, and still more the Royal Engineer, is more likely to succeed as a Superintending Engineer as he has the best education. The Royal Engineers are very picked men, the cream of the service. Colonel Home states that he has always endeavoured to employ pure Asiatics, but found that he could do so only up to a certain point. As subdivisional officers, Native Engineers did their work, on the whole, very fairly. They were, however, less active than Europeans. There was some difficulty in getting them to move about. They required much more detailed instructions and orders as might be expected, and would not accept any responsibility. As upper subordinates Natives were very efficient and Europeans are rarely employed (in the Irrigation Branch) except in construction works. This refers to Natives of the Punjab. An attempt was made some years ago to replace Assistant Engineers by subordinates. In one or two cases in the North-Western Provinces, this was done with considerable success, but in the Punjab the plan was unsuccessful. Sharp men were selected from the upper subordinates grade, and specially trained and then put in charge of the subdivisions where the work was mainly repairs, maintenance, and distribution of water and not much construction. The work was not done as it should have been done. The zemindars did not look up to the men as they did to Europeans and would not obey them. The men chosen were themselves Punjabis. The witness would not promote from subordinate grades; men would be too old. Knows several instances of such promotions. The men were all failures.

Mr. R. B. Buckley, C.E. (Stanley) *Under-Secretary to the Government of India, Public Works Department; served since 1869; was a Whitworth scholar, and was at first employed in the workshop connected with the Sone Irrigation works*—considers that the Indian Colleges can educate only for less scientific work. The Cooper's Hill men as a class are better educated than the men from Indian Colleges, and possess also the advantages of English training which gives higher tone to their character. Altogether, and as a rule, they are men of a better class and standing—a fact which gives them a better position in society and moral assistance in enforcing their orders and doing their duty to Government. Natives in the opinion of witness are thoroughly competent for many appointments in the superior branches of the Public Works Department; but he thinks that their ability does not rise, as a rule, to what is required for purely Engineering works. They are excellent when what they have to do is merely imitative, but they fail in higher Engineering works in origination, invention, and design. When a certain work has to be done in a style with which they are conversant they are in many cases as good as Europeans. There is not much difference between Native and European Engineers educated at Indian Colleges. There can be no doubt that as regards Mechanical Engineering work, to which the Seebpore College is to a considerable extent devoted, Natives fail. The educated Hindu has little or no mechanical aptitude. There is mechanical aptitude in the country, but the classes of Natives who go to Seebpore and Rurki Colleges have not got it. Mr. Buckley would not promote from subordinate grades. He is opposed to the maintenance of such a large staff of Engineers as at present. Much of the work now done by Assistant and Executive Engineers could be done by men of an inferior standard of education. The Engineers should be a *corps d'élite*, not merely men competent to execute works. Natives may be found in this country excellent for executive works, and if Engineers in the higher establishment are reduced, a much larger number of executive men, including Natives, may be employed, *e.g.* in subdivisional charges. At present a Cooper's Hill man is kept for 15 years manufacturing bricks and lime and putting them together: a man's capacity for superior work is thereby weakened. The witness also objects to differences in pay of men doing the same work.

Major J. W. Ottley, R.E., *Superintending Engineer, Irrigation Branch, Punjab*, considers that the Cooper's Hill men are of higher social position and general education than Indian students. The best of these are equal to any man in the world. Of those he has known half were very good and the

remainder moderate down to bad. The practical course (two years*) given in England is in the opinion of witness absolutely useless, and such a course should be undergone in India where the works the students would see would be infinitely more useful to them for employment in the Irrigation Branch. Some of the Rurki Engineers Major Ottley has known are as good as the best Cooper's Hill men and of the whole number half were good. These, however, were nearly all Englishmen who had come out to India and passed through Rurki. In the earlier periods of service there can be no comparison between the young Rurki men and the Cooper's Hill men. Great qualifications are not required for an Assistant Engineer, but there can be no doubt that every young Rurki man comes to the service fully prepared to do the work. He knows the language and the country, whereas a Cooper's Hill man, with considerably greater intellectual powers, knows nothing of the country and has to undergo a period of apprenticeship in order to acquire that knowledge. However, with the alteration in the training he has suggested, the witness would, if allowed to choose a number of men from Cooper's Hill or Rurki, choose them from the former. He sees no objections to men all coming from the same institution. Native Engineers fail from want of observation and want of activity, and in cases of crisis and emergency a European is by far the best. Failure in such cases might be most disastrous to the canal and to the whole country subject to irrigation and lead to a failure of crops. Witness quotes two such cases, one a breach in a canal embankment 60 feet high, which required instant action and was closed in three weeks at a cost of R6,000. The other was a failure of a work on the canal where water was most urgently needed down below. The breach was closed within a week by the local officer who had attended to the work day and night. Had it not been promptly attended to, the loss to Government would have been four or five lakhs of rupees. There is also a difficulty in employing Native Engineers in the Irrigation Branch from the necessity of providing separate quarters for them in jungly places as their caste prejudices will not always allow them to live in the same bungalow with Europeans. Major Ottley refers to the ill success of the experiment already alluded to by Colonel Home of employing picked Native Overseers in independent charges. The experiment was not successful. The men employed did not work cheaper and did worse work on the whole. There was also a want of initiation and observation. He would not employ Bengalis in the Punjab.

* The course is generally for one year, *vide supra.*

MR. R. BRADLEY, C.E. (Rurki), *Executive Engineer, Irrigation Branch, Punjab, educated at St. Xavier's College, Calcutta,*—thinks training at Rurki sufficient. Sees no superiority in the Cooper's Hill man as to technical training, and in the earlier period of his service he is less useful owing to want of local knowledge. Doubts, however, if Indian Colleges could supply all the wants of the Department, and considers there is an advantage in having an admixture of men from England. Cannot speak of Native Engineers as a class. As to upper subordinates, has found them often well conducted and intelligent but wanting in energy and backbone and unable to command the good-will of the work-people to the same extent as Europeans. Refers to cases of the men in charge of subdivisions whose work was poor and management of their charges perfunctory. They would wait for orders and would not act on their own responsibility in emergencies. Pensions and furlough spent out of India should be the same for all.

MR. T. HIGHAM, C.E. (Stanley), *20 years' service, Superintending Engineer, Irrigation Branch*—is not disposed to prefer one to the other of the best Cooper's Hill and Rurki men. The latter are well trained for Assistant Engineer's work and very useful in that capacity owing to their knowledge of the languages. The Cooper's Hill men are deficient in that respect at first, but after a year or so become quite as useful as the Rurki men, and some of the best of them are better. As to Native Engineers, he has not much experience. Thinks Natives have no aptitude for Engineering and refers to the small number who go to Rurki. Believes they prefer service in the judicial line. The wish of the Native Engineers he knows was to get revenue work and become vested with judicial powers. Natives as subordinates are very good, and to be preferred to Europeans unless on large Engineering works involving difficulties of construction. Their want of general education unfits them for Assistant Engineerships. Furlough and pension should be the same for all classes except that Natives would not want so much pension.

MAJOR CORBETT, R.E., *Executive Engineer, Irrigation Branch, North-Western Provinces, and Superintending Engineer (temporary)*—considers Cooper's Hill men superior to Rurki men on account of their English training. The technical training at Rurki is excellent so far as it goes, but it lasts only two years, so that in this also the Cooper's Hill men are somewhat superior. They are not so useful at first, but in a year pick up sufficient knowledge of the country. Would prefer men from different institutions, and refers to the case of the first Stanley Engineers who were very good. The upper subordinates are all educated at Rurki. Some of the military men who get to the higher grades are excellent, as are some few Natives. There is no better source of supply than the army for the kind of men wanted for the heads of canals. There has beenno friction between such men and the people of the country where they were placed in charge of subdivisions, but they were all picked men.

MR. A. GRANT, C.E. (Stanley), *20 years' service, Executive Engineer, Irrigation Branch, Personal Assistant to Chief Engineer, North-Western Provinces and Oudh*—thinks that Cooper's Hill men are superior both in technical and general education, that they have their wits more about them in emergencies, and that they display greater energy of character and bodily vigour. Has had experience only of Bengali Natives as Engineers. They were educated at Rurki or Seebpore. They have not the energy so necessary in an efficient officer, do not push on work and seldom initiate anything. They were wanting in administrative ability and did not get on well with the people of the North-Western Provinces. It is absolutely necessary to employ Europeans at the head-works of canals.

There is a greater liability to accidents there, and the men in charge must have presence of mind and resource to enable them to act at once in emergencies. Want of these qualities might have most serious results. The men in charge have to be constantly on the watch and in case of floods to drop certain sluice gates, and any delay in doing this might involve serious floods and practically destroy the utility of a canal for a season, or even for a longer period, and cause irreparable damage or serious loss of life and revenue. Promotions should not be made from the upper subordinate grades. The men would be too old for efficient service as Assistant Engineers, and, as a rule, their social position would not fit them for the post. Honorary rank is a reward for long service in lower grades like Native titles of honor. The Canal Deputy Magistrates are all Natives. They are carefully selected from a large number and rise from the lower grades. As regards furlough and pension, the distinction between men recruited in England and in India should be maintained, except that furlough under more favorable conditions than at present might be given to Natives wishing to visit Europe or America. The payment of pensions to officers of the class to which witness belongs in rupees has the effect of deterring men from retiring, the amount being uncertain.

MR. C. W. ODLING, M.E. (Stanley), *Superintending Engineer, Irrigation Branch, Bengal*—considers that the Cooper's Hill men are superior to those from Rurki as a class, their general education is very much better, and it reacts on their technical education. They pick up very quickly the work of assessing water rates and take a great interest in it. Except for Mechanics, where Europeans are best, Mr. Odling prefers Native subordinates. They, however, lose mental and physical activity to a greater extent than Europeans as they grow older, and this is a difficulty in the employment of Natives. In Behar, where witness is serving, the Road Cess Engineers employed by the District Boards for the maintenance of roads and bridges in their charge are principally Europeans.

Roads and Buildings Branch.

MR. H. IRWIN, *Superintending Engineer, appointed from service under Ceylon Government,* is of opinion that the Cooper's Hill men are extremely well educated and promise to do well. They are more likely to be useful in the Department and to prove a better class of men for the higher appointments than the Rurki men. Their technical education is better and they show a greater knowledge of their work on first joining. Has known men from Cooper's Hill and Rurki whose tastes lay in a different direction from Engineering. One or two of the latter were quite useless as Engineers. The present system of appointing men from colleges and paying them for learning their profession is not a good one. If Government intend to employ men from England, it would be more economical to appoint men who had a previous practical training than to select men from Engineer officers. Promotions should be made from the upper subordinate grades only in very exceptional cases. European subordinates are more trustworthy and have more resource than Natives. The most useful Native subordinates are men of the artisan class. They should be made Sub-Overseers, but should not be entrusted with cash to expend on labour.

MR. H. P. BURT, C.E. *Executive Engineer* (Cooper's Hill),—would make no change in the present system of recruitment and would not promote from upper subordinate grade. Men so promoted would not command the respect of their subordinates. Honorary rank is a sufficient reward.

MR. W. B. BESTIC, C.E. (Cooper's Hill), *Junior Secretary to the Government of Bengal, Buildings and Roads Branch*—has been Examiner at the Seebpore Engineering College, and states that there is little difference, so far as the curriculum is concerned, between the course of study there and at Cooper's Hill. In engineering and applied mechanics, the standard attained is not high enough. The general education of the students is not sufficient to enable them to take advantage of the technical training to the fullest extent.

MR. JOHN WILCOCKS, C.E., *distinguished student at Rurki—sent home in 1885 for two years' practical training*—considers that the men he knew at Rurki were on the average not equal to the Cooper's Hill men from the mere fact that they had not been in England. Cooper's Hill men have the advantage of seeing large works which could not be seen in India, and their general education is somewhat superior to that of the average Rurki student. The professional instruction given at Rurki, so far as books and laboratory works are concerned, is not inferior to that which the average Cooper's Hill man gets; and if a Rurki student obtains the opportunity of training in England after he has had some practical work in India, he will certainly not be inferior to the Cooper Hill's man, if men are compared who are equal in intelligence.

MR. T. DEVERIA, *member of the firm of Marillier and Edwards, Civil Engineers and Contractors, Calcutta*—states that the firm employs Europeans in preference to Natives, as they find them more reliable and better suited for the work they have to do. The highest salary paid to a Native in their Works Department is ₹150. The salaries paid to European employés in their yard ranges from ₹300 to ₹450. They import their men from Scotland as they cannot get competent Natives. Natives are very good workmen as far as manipulation goes, but they do not use their brains as they might, and require to be shown. Calcutta firms employ European superintendents.

BABU KHETTER PRASAD MUKERJI, *Executive Engineer, Public Works Department, and District Engineer, 24-Pergunnahs*—was educated at Seebpore, and considers that the course of study there is sufficient to make men competent Engineers. It does not pay Natives to adopt the profession of C.E. There are few opportunities in this country for Engineers to find employment except in the service of Government, and other professions are more lucrative. More Natives should be admitted into the Public Works Department. It is their best training field and their greatest ambition. After they have

taken the B.A. degree, they should have two years' training in Engineering Colleges and two years in workshops, and be then appointed to the lowest grade in the Engineers. While students they should pay tuition fees. Living for Natives is now more expensive; hence witness would give these students ₹200 instead of ₹100 per mensem. Men who rise from the subordinate grades are inferior to Cooper's Hill men as regards theoretical knowledge, but better in practical work. Exceptional promotions should be made from subordinate grades. No Overseer qualified for such promotion has ever served under the witness, but he knows of two men who, if promoted, would be no discredit to the Engineers. There are passed men who would now come into the subordinate grades if there were a prospect of promotion.

MR. J. H. TOOGOOD, *Executive Engineer, Bengal, in charge of Workshops at Seebpore Engineering College (Howrah)*—thinks that to a great extent on ordinary works the course of study at Seebpore is sufficient to make a man a competent Civil Engineer, but there is not the same opportunity for the students to see large works as in England. In the College there is a Civil Engineer and an Apprentice class. In the former there are about 50 students who pay, Europeans ₹360 and Natives ₹180 per annum. Europeans generally take the highest places and obtain the appointments in the Public Works Department as Engineers, one or two per annum. Local Boards also recruit for Engineers from the students. The Apprentices, after completion of their course, get employment under the Public Works Department or private firms. Promotion in the subordinate grades of the Public Works Department is very slow. Some men after 15 or 16 years are still Overseers. In order to secure a better class of men, would advocate progressive pay and occasional promotion of best men to Engineers.

BABU KHETRA NATH BHATTACHARJEA, *formerly in the Public Works Department, now practising on his own account*—considers the system of recruitment needlessly expensive and unfair to Natives. Recognises necessity of recruitment of Royal Engineers as a matter of military training, but complains of Cooper's Hill College. The men appointed from there are all well provided for, whereas passed students of Bengal Colleges are unemployed or in inferior positions. European firms employ Europeans in preference to Natives as they have their own protéges to provide for. Seebpore and Rurki turn out men competent to undertake any work in this country.

BABU KHETTER MOHUN BOSE, *Pensioned Executive Engineer*—thinks that recruitment from Cooper's Hill is not only extravagant, but injurious to the development of indigenous talent. The courses of instruction in the local Engineering Colleges and workshops attached to them are sufficient for the requirements of the Department. The Department should be reorganised and repairs of roads and buildings made over to District Boards.

RAI SAHIB BAMA CHURN PARAMANIC, *Honorary Assistant Engineer, Bengal*—is of opinion that the training in local Engineering Colleges is theoretical and practical, and is not inferior to that given at Cooper's Hill. Cooper's Hill should be abolished as it is unnecessary. Higher administrative posts should be recruited from Royal Engineers and more appointments filled from Indian Colleges. There are 68 passed students of Seebpore alone without employment. Deserving upper subordinates should be promoted to Engineers as formerly. Honorary rank is appreciated, but substantive promotion when earned should be given. The strength of upper subordinates should be increased so as to remove the block in promotion, and all appointments to upper subordinates should be gazetted as formerly. Promotions should be made also from lower subordinates to upper subordinates to attract good men.

RAI BAHADUR MADHUB CHUNDER RAI, *Executive Engineer, Public Works Department, Bengal*—considers that European Engineers as a rule are better educated. Civil Engineers trained in India procure the execution of works by the influence they exercise over the laboring class, whereas the others do the work equally well so far as technical knowledge goes, but more by compulsion than influence. In building ordinary bridges locally educated Engineers are quite equal to those educated in England, but not on large works, as sufficient scope is not given to Indian Engineers. Proportionate pensions ought to be given after 10 years, and furlough should count as pensionable service. There should be the same pension rules for all. Would promote from subordinate grade in exceptional cases.

BABU KHEDER NATH CHATTERJEE, *Executive Engineer, Public Works Department, Bengal*—thinks that there is no difference, so far as technical knowledge is concerned, between Engineers educated at Cooper's Hill and Indian Colleges. Energy in carrying out works depends on the individual. Natives can undergo greater fatigue and knock about a good deal more than Europeans can, and show the same energy in pushing on work. Eurasians and domiciled Europeans cannot endure so much hardship as Natives. Would promote from upper subordinate grades in exceptional cases and extend concessions as to pension lately made to Engineers from England to Natives.

BABU KEDAR NATH SEN, *Sub-Engineer, Public Works Department*—writes that there are too many Engineers on the roll; that the Cooper's Hill College is an excrescence on the Indian expenditure; and that Engineers, and especially Cooper's Hill men, are unduly favored as compared with subordinates.

COLONEL E. SWETENHAM, *Bengal Staff Corps, Superintending Engineer, Buildings and Roads Branch, North-Western Provinces; received professional education at Rurki*—is of opinion that the efficiency of the men from Cooper's Hill and Rurki is about equal on the whole. Rurki men are more useful for the first five years. The Rurki men as regards physical fitness are not inferior but may be slightly so as regards moral qualifications, *viz.*, firmness and decision. Would promote from the upper subordinate grade to Engineers only in case of exceptional merit. The men who have reached the senior grades would be too old for Assistant Engineers. The military men recruited for the subordinate

India.
P. W. Department.
Section I.

grades through Rurki are strong men. The army is a fine field for selection, and more than 10 or 12 men are not taken annually with the whole army to choose from. They are a better class of men than could be got by recruiting locally. In regard to pension and furlough, there should be no distinction between men in the same service, except that more favorable furlough granted to Natives should be spent in Europe or America.

MR. W. C. WRIGHT (Rurki), *Executive Engineer, North-Western Provinces, Buildings and Roads Branch.*—For the first two or three years Rurki men are more useful, but afterwards Cooper's Hill men are better. The Rurki man does not improve, and of late years, due possibly to what are called the Rurki Resolutions, the batch of men from Rurki is not so good as before. Their defects are due to their having been brought up in India. The Resolutions cut off the supply of men from and educated in England. The best Rurki men are equal to the best Cooper's Hill men. The professional education of both is equally good, but the Cooper's Hill man, having a better general education, can take more advantage of his professional education. A certain proportion of the upper subordinate grade should be military men. Has known several very good men both as to work and steadiness, but for certain classes of work a Native is better. At headquarters a European is most useful, but there are difficulties in providing accommodation for him elsewhere. In regard to pension and furlough, Mr. Wright considers it a hardship that he is not on the same footing in these respects as Cooper's Hill and Stanley Engineers. Officers ought to be encouraged to visit Europe by liberal furlough rules, and it is desirable that they should be able to take pension at an earlier period without medical certificate than 20 years' service, as Stanley and Cooper's Hill Engineers can now do.

MR. F. T. ATKINS, *President of the United Railway and Government Servants Association, and member of the Committee of the local Eurasian and Anglo-Indian Association, Allahabad*—thinks that the Cooper's Hill College ought to be abolished and Engineers locally educated more largely employed. Greater facilities should be given for the employment of domiciled Europeans and retired soldiers in the different grades of the Public Works and Telegraph Departments.

COLONEL ARTHUR LANG, R.E., *Chief Engineer of the North-Western Provinces and Oudh.*—This officer has served in the Department for 32 years, and was Principal of the Thomason College at Rurki from 1871 to 1877.

The following extract from his letter, printed in Section II,* gives his opinion as to the relative merits of the different sources of supply and of the capacities of the different classes of officers employed in the Department. The Lieutenant-Governor, Sir Alfred Lyall, in forwarding Colonel Lang's letter, records his opinion that that officer's estimate of the capacity of Natives for rendering efficient service in the higher branches of the Department is too unfavorable, and proceeds too much upon the experience of the past, without taking into sufficient account the probable results of higher and more extended education, and of the greater encouragement that should be and will be given to Natives of ability and fair social position to compete for the Rurki appointments. Sir A. Lyall has himself no doubt that the Rurki College might be expanded into a more valuable training school for Native Engineers in Upper India, and he would allow all Native Engineers once admitted into the Public Works Department every opportunity of showing themselves qualified as they rise by seniority for the duties of the grade of Executive Engineers. The Engineer grade in the North-Western Provinces and Oudh, it may be premised, consists of 126 officers, of whom 11 are pure Natives, 12 are Royal Engineers, 13 are Stanley Engineers, 43 are Rurki Engineers, 38 are from Cooper's Hill; and it is stated that Royal Engineers have not joined the provincial branches for many years, and are gradually disappearing from these establishments. Colonel Lang writes:—

"As to the comparative value of the sources of supply, there can be no doubt but that the Corps of Royal Engineers supplies the best men. They are the outcome of hard competition throughout, and have enjoyed a training not to be elsewhere surpassed—two years at Woolwich and two years at Chatham, and generally before coming to India they have served on works at home; they are the cream skimmed off the outturn of Woolwich, and the *esprit de corps*, the discipline, and the high traditions which they have to maintain tend to ensure their being a *corps d'élite*. In regard to education, the primary training for a Royal Engineer or a Civil Engineer is the same. Each enters on his practical work (where alone the art of Civil Engineering is very gradually learned) similarly equipped, the difference being only in the individuals and the amount of knowledge each has mastered. It is understood that the consideration of this source of supply is beyond the immediate scope of the Commission's enquiries, as the employment of Royal Engineer officers is a matter of imperial policy: fields of training and employment must be found for them in times of peace, and while the public works of the country are greatly benefited in securing their services, the Army also reaps many advantages in the powers of administration, skill in management of labour, familiarity with the resources of the country and its materials and modes of work gained by its Engineers in the fields of the Public Works Department. The military works are naturally entirely in the hands of the Royal Engineers, but the railway branch is a field especially suited and necessary for them, while the irrigation branch also offers in some of its branches of work opportunities particularly valuable for stimulating the qualities needed by the Military Engineer. It is, therefore, in the interests of the corps, and also of the public works, that a certain proportion of the recruits for the provincial branches of Public Works shall be taken from the Corps of Royal Engineers—a measure which, as above pointed out, is now neglected.

"In respect to the comparative merits of the Cooper's Hill and Rurki men, evidence is being everywhere collected by the Sub-Committee, who are also in possession of all the most valuable records of this office in respect to the evidence collected in past years as to the merits of those two classes of

* Volume of Proceedings relating to the Public Works Department.

men, and the value of the Native Engineers in the Department in these Provinces, and also in regard to the opinions on these subjects recorded by General Fraser, General Brownlow, and numerous other officers of experience. On this point, therefore, it is necessary only to note that while value is attached to the advantage ultimately gained in his career by the Cooper's Hill man from his early English surroundings and breadth of education thus ensured, yet that the Rurki man has many years' start of him in his practical Indian training, by his familiarity with the country, its people, languages, ways, and resources, and that the best men of the two schools are much on a par. A glance at the distribution returns of the Public Works Department will show that many of the highest appointments and the charge of many of the largest works are in the hands of Rurki men. There seems room for both classes, and the variety of characters, tastes, and aptitudes secured by recruiting in two or three different fields is considered by many to be advantageous in a profession such as Engineering which opens varied fields suited to different men. At present the number of men recruited from Cooper's Hill exceeds that admitted from Indian Colleges. It may be considered advisable to lessen this irregularity, and if so, it may be noted that Rurki, in the extent of its accommodation in quarters and class room, in the strength of its staff, and the number of candidates for admission, is capable without extra expense to this Government of training at least five times its present outturn, and indeed of supplying all the Engineers (in excess of the Royal Engineers) required for the Public Works of Northern India. The annual outturns of the Engineer class admitted to appointments in the Public Works Department varied between 20 and 30 twelve or fourteen years ago. Natives as well as Eurasians and Europeans domiciled in India enter the Public Works Department from Rurki. In the Entrance examination the candidates of pure Native descent are not so successful as their more specially trained rivals, the latter working at the Hill School specially for Rurki, the former reading for their B.A. degrees. Once, however, in the College, the Natives hold their own and need no special concessions in their favor. Of this year's outturn two are Natives and two Europeans (domiciled in India).

"If the Public Service Commission do not confine their considerations to only the present sources of supply, it may be noted of the 'Stanley Engineers' (among whom are some of our best men) that the system failed. At first it secured, as was intended, young Engineers actually working in England. Eventually, however, there sprang up a class of candidates nominally practising Engineer apprentices, but actually boys working for the competitive examination while articled to Engineers and attending their offices only to satisfy the prescribed conditions. Such candidates have the advantages neither of education in a recognised technical College, nor of the practical young Engineer on works. If any reversion to this mode of recruiting be contemplated, it would need careful revision.

"There seems no hope of finding any other Native source of supply than the educated B.A. schoolmen of our higher Colleges who receive their technical education at Rurki. The best and widest education is needed for our young Engineers, and cannot be dispensed with in favor of qualifications of good birth and high status unaccompanied by such education. Moreover, scions of the nobler families of the more warlike races of Northern India would not accept a career in the profession of Engineering, and it will be useless for many generations to look to the higher ranks of the Native community to furnish candidates for the Public Works Department of a type superior to the middle classes from whence our present stock of Native Engineers is drawn, and so long will the decision remain that our Native Engineers want the hardy energy, pluck, and self-reliance which are needed from an Engineer in charge of large works, and in places of superior responsibility. This, however, is a matter for consideration rather under the next head: that is, of the professional and other requirements of the different branches.

"The actual qualifications required for admission to the several Colleges and classes, to the several grades and branches of the Department and for promotion to higher grades, are matters of fact recorded in regulations which will be supplied to the Commission by the Government of India. Here only as a matter of opinion it may be noted that the requirements of the Public Works Department (as of most Departments of the public service) vary in different grades and branches, and that consequently different classes of men suit different positions. Pure Natives fill admirably the lower subordinate grades, of which the salaries are below R100 and for which Europeans would be unsuitable. In the upper subordinate classes there is room for the European non-commissioned officer, the 'Civilian' European or 'Eurasian' and the pure Natives: each class is wanted and each finds suitable scenes and work. The former is needed for works connected with troops; and his superior hardiness, energy, self-reliance, promptness, and pluck render him an indispensable subordinate employé on canal head-works and similar positions where delay and indecision in emergencies would lead to great dangers and losses. For rough work on hill roads, or in cold climates, these are the only suitable style of men. The steadiest and best men of this class form our best subordinate agency, and indeed share many posts, such as those of District Engineers, with men of the superior Engineer classes. Many of the Civilian Europeans have very similar qualifications and are useful employés. The Native upper subordinates vary very much. Some of them are of very poor stuff, but again, as before stated, some of our best upper subordinates are Natives, honest, intelligent, and hardworking, and ready to work in native villages and localities in the plains of India unsuitable to a European.

"In the Engineer grades the qualifications required for the Assistant are chiefly that he should be intelligent, industrious, honest, and obedient. These qualities may be found in every class, European or Native. The Native as an Assistant forms a good Engineer and gives promise which too often leads to disappointment in higher grades. The Executive Engineer has greater responsibilities, needs more self-reliance and promptness, and his tact is brought into play in

dealing with a wider range of fellow-workers. Here wider education and a more vigorous character come into play: the more English in temperament, traditions, and education the Engineer is, the better executive should he be. This points to the advantages of the English training of the Royal Engineer and the Cooper's Hill man. Many of the Rurki Europeans, however, with hereditary race characteristics, though domiciled in India, are scarcely behindhand. But the pure Native falls behind in the race, and though capable of holding charge of an ordinary division or district with efficiency and credit, needs more help and supervision from superior officers, and would not be selected for a division with very heavy responsible works, and where prompt self-reliance and extreme activity and pluck were essentially necessary. For Superintending Engineers, and still more for Chief Engineers, administrative capacities are needed, and greater ability, broader views, and manner and character suited for a strong yet sympathetic rule of their juniors and for harmonious interworking with a diversity of men and departments. For such posts pure Natives for obvious reasons have not hitherto proved suitable, nor are they likely to rise to such posts for some time to come,—probably not before the necessity for a European control of the several Indian nationalities has ceased. The opinions above expressed on the professional requirements of the several grades, &c., involve for the organization of our Indian Public Works Department the necessity for a very strong English element in the higher grades for the present, and for a future with no appreciably early limit; for the Engineer establishment a liberal employment of the best agency available, that of the Royal Engineers corps; a proportion of Engineers with thorough English training, such as furnished from Cooper's Hill; a proportion, moreover, larger than at present of the useful men furnished by Rurki. For the upper subordinates also a strong English element in which the pick of the ranks of the Army shall be represented by an annual selection of smart non-commissioned officers, and the Indian schools may furnish European or Eurasian youths of good education. Here, however, a larger field is open for Natives such as the upper subordinate classes of Rurki turn out. The lower subordinate grades may be left entirely to Natives. From this field occasionally exceptionally able men may rise to the higher grades in which a few of our best Native Engineers and upper subordinates owe their first training to this extensive lower field."

MAJOR R. HARVEY, R.E., *Superintendent of Works, Public Works Department, General Branch, Punjab*—comparing the best Cooper's Hill and the best Rurki men, thinks that the superior education of the former will tell in strictly professional work and tell more as years go on. At starting a very good Rurki man would probably have a slight pull over a very good Cooper's Hill man, but the difference would diminish and ultimately the advantage would be the other way. Rurki Engineers are excellent. They join the Department knowing the country and the language, and are, therefore, less likely to be taken in or deceived in any way, and for the first three or four years of their work a good Rurki Assistant Engineer is not to be beaten. Military Engineers should be employed more largely in the General Branch of the Punjab Public Works Department, especially in cantonments on the frontier and making roads through wild frontier districts. As regards the recruitment from Cooper's Hill and Rurki, there should be two from the former to one from the latter. This would include Native Engineers from Rurki. Native Engineers are unfit for frontier cantonments, where activity and good riding are wanted. The country is wild and operations are semi-military, and a Native Engineer, a Babu, is ill fitted to go about among frontier Mahomedan tribes. Promotions should not be made from the upper subordinate grade. The men are deficient in general and technical education. For service in that grade Europeans are superior to Natives on emergencies and in carefulness of work. Natives, however, are efficient as supervisors of work. Native soldiers, who have passed through Rurki, have proved particularly good as subordinates.

MR. E. C. OLIVER, C.E. (Stanley), *Under-Secretary to the Punjab Government, Public Works Department, General Branch; has served also in Irrigation Branch*—considers that there is little to choose between the best men from Rurki and Cooper's Hill, but the latter gives the larger percentage of good men. From Englishmen educated at Rurki there have been quite as good men as those from England, but as regards Eurasians and Natives educated there, there can be no question of the superiority of the Cooper's Hill man. Perhaps in the early part of his career the Rurki man, from his knowledge of the country, does better, but the better general education of the Cooper's Hill man would eventually tell in his favor. Regarding the future recruitment Mr. Oliver stated as follows (explaining subsequently that among Natives he included Eurasians but not domiciled Europeans, and that the same remarks applied to the Engineering as distinguished from the Revenue work of the Irrigation Branch): "Regarding the future recruitment for this Department, I have rather an idea that a great deal might be done if we had a larger number of men occupying a subordinate position. A large number of the men now employed in the Public Works could, I think, be obtained and be quite as useful if employed on a much lower pay and status than at present. If, for instance, we recruited men on pay rising from, say, R150 to the pay of a Sub-Engineer, *viz.*, on R400, such men might be largely recruited in India, and a good number of them might be Natives of India. Such men are, in England, called 'Clerks of Works,' have seldom a highly scientific training, nor have they necessarily to deal with payments of money. Such men might, in my opinion, perfectly well hold many of the charges, subdivisional and otherwise, now held by Assistant and even Executive Engineers. But for the higher professional duties required in the Department, I certainly think it is necessary to recruit largely from England. The majority of the Natives now recruited are, in my opinion, not suited for Engineers in the Public Works, for although there are among them men who would probably pass excellent examinations, they are, as a rule, deficient in very many of the qualities which are wanted. They are deficient in organization and administrative power, in self-reliance, and to a certain extent in probity.

MR. OLIVER would extend the subordinate and diminish the Engineer service, and adds: "I wish to point out that the fourteen Natives in the Punjab Public Works Department are serving on exactly the same

pay as the men brought out from England, although, as I think, the larger proportion of them are not worth the money. I admit that there are some among them who are most excellent Engineers, but at the same time there are among them men who would be very well paid on ₹200 to ₹250 a month. This is, I think, a matter which should be taken into consideration in extending employment to men of this class." Mr. Oliver considers that as subordinates, except men who have been drawn from the Corps of Engineers, Europeans are not so generally useful as Natives. The pay, ₹60 to ₹400, attained after very long service will not always attract a good European, whereas it is attractive to a Native. The kind of European obtained for the lower grades is not so good as a Native. Promotion to Engineers should not, as matters stand at present, be made from the subordinate grade.

Rai Bahadur Ganga Ram, *Executive Engineer*—thinks that in order to attract more Natives to the Department of Public Works, the number of guaranteed appointments should be increased to 25, and the number of Natives turned out of the Colleges should be distributed to other Departments, such as the Accounts, Survey, Railway Traffic, and Telegraph Departments. Rurki students are among the best educated in these subjects, but their general education is inferior. They have only lately begun to appreciate the Engineering profession. Their superior knowledge of the country would enable them to work more economically. Pension and furlough rules should be the same for all. Natives should be encouraged to retire earlier, in order that they may start independent works while they have still some energy.

Mr. W. H. Johnson (*Rurki*), *Executive Engineer, Public Works Department, Punjab.* The best men of the two Colleges, Cooper's Hill and Rurki, are about equal. The latter do not recieve so good a general education. There is among them a larger percentage of indifferent men. Natives as Assistant Engineers do their work fairly well, but are not to be compared with Europeans. They have not the energy or originality of Europeans to deal with unexpected difficulties or devise means of overcoming obstacles with which they are not familiar, nor do they get on so well with their subordinates and workmen. Punjabis are better qualified than Bengalis ; on the frontier there should be as far as possible only Englishmen. Natives are capital draftsmen, accountants, and clerks. For ordinary works Mr. Johnson would rather have a Native Engineer, but on works where difficulties may arise a European is preferable. The recent rule prohibiting promotion from lower subordinate to upper subordinate grades is hard and inexpedient, as barring prospects of advancement for the best men in lower subordinate grades, many of whom have qualifications for the upper subordinate grade. Promotion is at present so slow that an Assistant Engineer who rises to ₹500 in three or four years cannot rise to ₹950 for 20 years longer. Too many highly educated men are employed doing ordinary work. A system of progressive increases should be introduced ; and as to pension and furlough, distinctions between different classes of officers should be done away with.

Dr. T. Cooke, *Principal, College of Science, Poona*—states that the College teaches for the University degrees and for the degrees of Licentiate of Civil Engineering and Bachelor of Science. The course of instruction is almost identical with that of Cooper's Hill, but teaching to fit a man for the higher branches of the profession is in a great measure wanting. There are fewer opportunities for seeing large works than in England and the staff of Professors is limited. At least two or three more are required. There is a Mechanical Engineer class, which not only supplies the Department, but qualifies men for employment as Marine Engineers. Not much practical training can be given, but that has been found to be nearly impossible in all Engineering Colleges. The men turned out by the College are qualified for the work of the Survey Department. Dr. Cooke is in favour of importing Engineers from England chosen from the bulk of the profession, but not from a College. Men in India have neither the gift nor opportunities for acquiring a practical knowledge of their profession.

Mr. J. H. E. Hart, C.E., *Chief Engineer and Secretary to Government, Irrigation Branch, Bombay*—considers that professional training equal to the Cooper's Hill standard is impossible in India. Professors equally good are not to be had. The range of teaching is narrower; there are no opportunities for inspecting large works as in England. Hence Cooper's Hill men and Indian students can scarcely be compared. The former are superior in professional intelligence and force of character. Native Engineers are in a few instances good and in others very inferior. They are more useful in dealing with Natives, but want decision of character in difficulties and in works of construction show no capacity for the practical application of theoretical knowledge. In the Irrigation Branch there is more administrative work, and in that branch Natives are as good as or better than Europeans if their moral tone is equally high. They are inferior to Europeans in physical endurance and in general education. High education is not essential for service in the Public Works Department. Such service calls more for powers of hard work and physical exertion than for education. Engineers from Europe should be selected generally from the profession and not from students of Colleges. Sufficient theoretical training could be given for Public Works Department Engineers by the College of Science at Poona. All Licentiates of Civil Engineering should enter the Department in the upper subordinate grades and be promoted from them into the Engineer grades.

Rao Bahadur Khandubhai Gulabbhai Desai, C.E., *Executive Engineer*—observes that the two Engineer appointments available annually are given to students who pass in the first division of lower Civil Engineers. The standard which used to be 50 per cent. of the maximum marks has been raised to 66⅔, which is a hardship. If two men do not pass in the first division, only one Engineer's appointment is given, and the next man is appointed to the Apprentice grade; about ten students pass

out of the College annually, two becoming Engineers. Overseerships are offered to the others or they shift for themselves. Natives should be more largely employed on the ground of economy. Though the pay should be the same, yet they require less liberal leave and pension rules. Their length of life is shorter as shown by the insurance offices accepting lower premia from them and their pensions are paid in silver. Students from the Colleges should be employed on the railways to learn practical work and should be admitted more freely into that branch, and also into the Accounts Branch. Promotions should not as a rule be made from the upper subordinate grade.

COLONEL A. T. MANDER, R.E., *Superintending Engineer*—considers that the present system of recruitment is satisfactory. The Cooper's Hill men get a better professional education, they are taught by better men, and have more opportunities of seeing large works. The general average of excellence among them is higher than among Engineers from the College of Science. The Poona College of Science could not educate up to Cooper's Hill standard. It, however, turns out men with fair professional theoretical education, but their general education is inferior. Not very many Natives are thoroughly competent Civil Engineers. Their general faults are want of energy and want of courage in emergencies, and they have not seen large Engineering works; but there are some brilliant exceptions to this description of the class. Good students should be sent for practical training to an Engineer in England and exceptional merit in subordinate grades should be rewarded by promotion to Engineers, and lower civil Engineers should be encouraged to enter upper subordinate grades by holding out that prospect. Natives are in Colonel Mander's opinion, quite competent to do survey work and to take charge of working parties. The witness thinks that in Bombay, as in Bengal, Military Works should be a separate branch.

KHAN BAHADUR MANCHERJI KAVASJI MURZBAN, L.C.E., *Executive Engineer*—considers that Natives are quite fit for service in the Engineering grade, but for some time there should be in that grade a fair proportion of Royal Engineers and British Civil Engineers. The former by their high education and military position give prestige to the Department, and the latter bring to it fresh knowledge acquired by visits to Europe. Such Engineers should be drawn from the profession at large and not taken fresh from College. Assistant Engineers should be posted to offices of Executive Engineers in charge of large works. Native Engineers are better than Europeans for checking scamping of work and fraud on the part of contractors. In the efficiency of their works there is not much difference. The European Engineer's education is superior. The present system of appointing Natives is not satisfactory. Students at the College give more attention to subjects likely to tell well in the final examination; hence they know more of Mathematics for instance than of Engineering. Three or four of the most successful men of each year should be employed as upper subordinates and promoted thence to the Engineer grade. The upper subordinates should be all Natives except military subordinates for military works. At present Europeans are admitted to the upper subordinate rank as first grade Overseers on ₹100, and Natives to the third grade on ₹60. Hence an undue proportion of higher grade appointments is held by the former. On the other hand only one European to the knowledge of witness has been promoted from upper subordinate to Engineer, while he knows of several Natives who have been so promoted. The witness himself is one.

RAO BAHADUR KASHINATH RAMCHANDRA GODBOLE, B.A., C.E. *Executive Engineer*—considers that Native Engineers can work cheaper than Europeans in consequence of their superior knowledge of the country, people, and language at the beginning of their service, and of the resources and labour capacities of the district in which they are employed. They also draw smaller pensions and take them at a later stage of life and require less leave. Europeans, on the other hand, are physically stronger and more enduring. Their general education is better, as is also their technical education in some particulars, such as ironwork and architecture, and they are better able to apply their knowledge. They are less afraid of responsibility and for this reason are superior in emergencies. Ordinary works might be entrusted to Indian Engineers, and special or extraordinary works to European Engineers imported for the purpose. There should be a higher and lower service distinguished by the different degrees of education required for the bulk of the men employed in each, but special merit in the lower service should be rewarded by promotion to the higher grade; men corresponding to Clerks of Works in England should belong to the lower service. There should be one Engineering College for India, which would allow of more and better Professors being engaged. Furlough should be given to Natives as to Royal Engineers to enable them to visit Europe and see large works.

RAO BAHADUR V. B. KANNIKAR, *Civil Engineer, retired; built the Secretariat at Bombay under the direction of the Superintending Engineer, General Fuller*—considers that Native Engineers should be more largely employed. They are as good professionally as European Engineers, and their knowledge of the rates enables them to do work more cheaply.

RAO BAHADUR MATAND WAMON, *Supervisor*—advocates the promotion of upper subordinates to the Engineer grade.

MR. T. D. LITTLE, C.E. (Stanley), *Executive Engineer, Khandesh; 27 years' service*—writes mainly with reference to the duties of an Executive Engineer holding an ordinary district charge. These duties are not always of a scientific character, but are multifarious and require a considerable amount of practical experience and a capacity for managing and organising labour. Royal Engineers are better for dealing with military stations and works, but as regards civil operations, there is not much to choose between Royal Engineers and Civil Engineers who accept permanent employment in the Department. Royal Engineers, however, who merely accept temporary employment in India, are unable to acquire the experience accumulated by those permanently employed on Indian works. Mr. Little would like in the Department a sprinkling of Executive Engineers who

have entered the profession through the ordinary channel of pupilage and have been trained in works under Civil Engineers. As to Natives, he thinks that it is too early yet to fairly estimate the value of Natives as Civil Engineers. He has known some do excellent service, but is aware that others are wanting in energy, in practical professional knowledge, and also in the tact and judgment so essential to successful administration. Very many who are able to pass a test mainly theoretical do not possess the physique and energy necessary for success as Civil Engineer, and it is most desirable that such men should be excluded. He is in favor of promotions from the upper subordinate establishment by examination from among candidates qualified theoretically and practically. He would make their promotions from men between 5 and 10 years' service. This would secure sufficient practical training, while the Assistants promoted would not be too old to rise to high positions in the Department. He adds that it is very desirable in the interests of all concerned that the Native members of the Engineer establishment should be the very best men obtainable, for otherwise the system of employing Natives in the higher grades may be handicapped and discredited. As regards upper subordinates, the great majority of whom now enter the service through the Poona College of Science, and of whom many lately admitted have obtained the degree of L. C. E., Mr. Little considers them as a whole decidedly good; a large number of them are intelligent and efficient, take an interest in their works, and manage to secure satisfactory results for their expenditure. They are often, however, wasted on duties which might be equally well performed by Sub-Overseers. He would be inclined to gradually reduce their numbers and increase the proportion of higher-grade appointments. This, with occasional promotion to the Engineer grade, as recommended above, would make the service attractive to still better men. For military stations, where the requirements are of a special character, he would have only military subordinates. In consequence of the increasing number of candidates, Mr. Little would gradually raise the educational standard for lower subordinates and endeavour to secure as candidates men who had qualified, but failed to obtain appointments, as upper subordinates. The number of lower subordinates should be increased, and specially qualified men among them should be promoted early in their service to the upper subordinate ranks.

Mr. George Lambert, C.E., *Superintending Engineer for Irrigation in Sind*—considers that the attainments necessary for officers in the higher grades should be exactly the same, no matter what country or class of the community they may be drawn from. He sketches what he considers necessary, which involves early scientific education at school, study at an Engineering College at home or abroad for two or three years, a year's training in a mechanical workshop or manufacturing works, and then two years' apprenticeship in the office of a Civil Engineer. Then the student may proceed to India to practise his profession and should choose the branch of Engineering for which he has more aptitude and desire. He had experience of an Assistant Engineer of the Hyderabad Amil class, and of another, a Brahman of the Deccan, who were educated at the Poona College. Neither had any technical training, one had a better theoretical knowledge than the other, but the practical knowledge of both was poor. The Amils of Sind, in Mr. Lambert's opinion, show the greatest aptitude for acquiring theoretical knowledge and applying it practically, and want only a full course of practical and engineering training to become as successful Engineers as the average men of the Department. The Deccan Brahmans he has met are inferior to them in this respect. Mahomedans and Parsis are as a rule inferior to Hindus in acquiring Engineering knowledge, and some are very low down in the lists of the Hyderabad Engineering School. These remarks apply apparently to officers employed in the subordinate grades.

Mr. J. E. Whiting, C.E., *Executive Engineer, Nira Canal, and Chief Engineer for Irrigation; 19½ years' service*—places the capacity for rendering efficient service in Civil Engineering works of the three classes of Engineers in the following order—

1st—Cooper's Hill men.
2nd—Royal Engineers.
3rd—Licentiates of Civil Engineering.

Colonel C. A. Goodfellow, R.E., *Superintending Engineer, S. D., Belgaum; 27 years in Department*—holds that the present system of recruitment of Natives for the Engineers and for upper and lower subordinate establishments is a mistake, inasmuch as at the College of Science at Poona the same education is given to all who compete for employment in the Public Works Department, whether in the Engineering or upper subordinate grade. Of those competing at the same examination one enters the Engineering and a certain number of the others the upper subordinate grade. The higher technical and professional education should be undergone by the Engineers only. The upper subordinates are not the better but otherwise for the smattering of science they have acquired in their College course. They soon forget it as it is of no use to them in their future calling, and they are disappointed and discontented men all their service. The same distinction as to education that is made between the upper and lower subordinate grades should be maintained between the upper subordinate and Engineering grades. In the subordinate grades Brahmans, owing to their intellectual superiority, preponderate, but suitability for the service is not confined to any one class; it is personal. If competitive examination continues to be the test for admissions, Brahmans will maintain their position for some time yet.

Mr. C. T. Burke, C.E. (Stanley), *Executive Engineer, Irrigation Branch, Poona Division; 19 years' service*,—considers that the course of study at Cooper's Hill College is very complete as a theoretical education, but that the time spent on actual work is not long enough to qualify the students for the work which is entrusted to them. It is also a mistake that Cooper's Hill students should be allowed to spend their year of practice on works in India. It should be compulsory that

the year should be spent on properly selected works in England. Technical instruction in workshops or engineering laboratories, such as are attached now to most of the best Engineering Colleges in England, and practice in surveying and building and in various other such subjects, are essential, and the study of drawing, including the various systems of projection and geometrical drawings, should be maintained throughout the whole course of an Engineer's training. Therefore, if Government desire to have the best class of Engineers, the education of the Engineer or officers' establishment should be undertaken in England and should include a practical course on actual works in England of at least one full year, or better still two years. Mr. Burke does not underrate the gain of a knowledge of the ways, manners, and habits of the people of this country and of their language, but a thorough knowledge of the profession is the first requirement for efficient service, and in no country are the opportunities for practical education so great or so varied as they are in England. Men of whatever nationality should be educated in England and should not be limited to one institution, so that a healthy competition may be fostered between different Colleges. Cooper's Hill Engineers are on the whole preferred by Mr. Burke to those educated elsewhere. He gives the following as the result of his experience of Natives in the subordinate establishment of the Irrigation Branch: "I have had a great deal of experience of Natives in the subordinate establishment, and in this position prefer them to any other class for the particular kind of work appertaining to the Irrigation Department. I may here say that during my service in this country I have been almost entirely employed in the Irrigation Department, and I know that the duties of subordinates require a large amount of sympathy with the large class of Native cultivators with whom they are brought in contact; it is desirable that they should mix with and reside amongst them; and intimate knowledge of the Native language is absolutely necessary, as well as an acquaintance with the manners and customs of the Natives, so as to more fully and readily understand their wants and requirements, their grievances, &c., &c. In surveying and levelling operations Natives are quite equal to Europeans. In the Accounts branch, as Accountants, Natives are quite equal to Europeans. In the actual construction of works Natives do exceedingly well in subordinate positions. Where they fail is in emergencies, and under sense of responsibilities, also, comparatively speaking, in want of energy and endurance. I consider Natives to be wanting in self-reliance; they are afraid of the heavy responsibilities which most Irrigation officers in charge of districts, or even of subdivisions, have frequently and constantly to undertake; they are not as energetic physically as Europeans, nor are their powers of endurance as great. My experience, therefore, leads me to think that while Natives are well suited for the subordinate establishment, they are not by any means as well fitted for the Engineering or officers' establishment as Europeans educated and brought up in England; but should Government desire to employ educated Natives in this capacity, it ought to be a *sine qud non* that they should receive their training in England."

Captain W. L. C. Baddeley, R.E., *12 years' service, Deputy Chief Engineer and Under-Secretary to the Madras Government, Public Works Department*—furnished the Sub-Committee at Madras with a note in which the view is expressed that any attempt to recruit the Engineering Establishment of the Madras Public Works Department from the Madras College of Engineering, or in other words, from the Madras Presidency alone, would result in failure. A broad distinction between the officers and subordinates of any Department is necessary for its efficiency, and the system of educating at the same College young men who will afterwards be officers and subordinates in the same Department is distinctly a mistake that can only be practically justified on the grounds of economy. Captain Baddeley would have one College in India to educate in Engineering all Natives of India who can afford to pay for the advantages of high education, with a certain number of guaranteed appointments as Assistant Engineers in the Department, to be competed for annually by the students who completed their course of studies. The present Indian Engineering Colleges should have no guaranteed appointments to a higher grade than that of Supervisor. As regards the upper subordinate establishments as at present constituted, military upper subordinates are preferable to civilians for employment on works in connection with the Military Department, such as are constantly in progress at Madras, Bangalore, Bellary, and other military stations. The work to be performed includes not only the construction and repair of the most valuable buildings in the Presidency, but also the Sanitary Engineering connected therewith, such as water and gas supply, drainage, &c., &c. Military subordinates usually prove most valuable men when employed either in the Irrigation or General Branch. To prevent supersession of civilians, military upper subordinates should be kept in a separate list for promotion. The promotion of upper subordinates into the Engineer grade has been discontinued of late years rightly in Captain Baddeley's opinion, and an upper subordinate should in no case be so promoted unless when he is still young.

Captain C. B. Henderson, R.E., *Executive Engineer, Acting Principal of the Civil Engineering College, Madras; 14 years' service in Public Works Department*—has held his present appointment only four months and has had no opportunity of observing the students during the course of their studies. He stated that the theoretical education given to students in the Engineer class during the three years' course is sufficiently high, and the two years' practical training subsequently given ought to be sufficient to turn out good men. There are objections to a single College for Engineers. The candidates are so few that the expense would be great. The language and modes of working in different parts of India are different and Natives would object to leave their own Presidency and go to distant places. There are now in the Madras Engineering College 170 students, of whom 15 are in the Engineer class and the others are qualifying themselves to become Overseers. He has had six Cooper's Hill men working under him. They were all good Engineers. They were superior in technical knowledge, in designing and organising, and got better work out of their subordinates than the men educated in India. They required some help at first, but after a year they gained experience and became acquainted with the

language. The students from Cooper's Hill examined by witness in professional knowledge passed the first time. The witness is aware that there are Cooper's Hill men in the country who have not yet passed the easy 3rd class vernacular examination. The subordinates educated at Indian Colleges were not of much use at starting, but worked fairly well after two or three years' experience. Eurasians could stand the sun better than men of any other race, and were stronger than pure Asiatics. Europeans broke down more quickly up-country than Eurasians.

Colonel Vibart, R.E., *Superintending Engineer, Madras Circle; 26 years' service*—has had much experience in irrigation works. Colonel Vibart would not increase the Native agency in the superior grades, and doubts whether the ordinary petty works of a district could be carried out efficiently by such agency. He thinks the Engineers he has known from Cooper's Hill incomparably superior in every respect to those he has known educated in the Madras Engineering College. The latter seemed to him to have acquired only a smattering of knowledge which they found altogether insufficient when brought face to face with practical work, but he knows one Native educated at the Engineering College who did admirable work on an emergency. The vernacular examination should present no difficulty to a Cooper's Hill Engineer, but several of them have failed to pass it. Educated Natives, some of whom had taken an engineering degree, did not do their work particularly well. They were not sufficiently active, nor did they take sufficient interest in the country and the works going on in it. A European gets a better acquaintance with the country than a Native as he is fond of going about shooting and riding. Some of the older class of subordinates who entered the Department otherwise than through the Engineering College did very good work indeed. One of these, a Mahomedan, originally a clerk, was rather good at aligning distributaries. Mr.——, born in this country, is a very good man and unusually competent. The large number of military subordinates is due to the fact that before the establishment of the College more men of that class than Natives used to enter. Their numbers have diminished and those of Natives have increased.

Colonel Pennyquick, R.E., *Superintending Engineer, Trichinopoly Circle; 25 years' service*—has had a great many Cooper's Hill men serving under him, and thinks that they are as near perfection as anything Government is likely to get by any system of selection. They are mostly men who have been educated in public schools and had the corporate training there and at Cooper's Hill which he thinks essential. He has also had as much experience of Native Engineers as is possible under the circumstances. He had no fault to find with their actual professional qualifications, but does not consider them at all fit for the upper grades of the Department. He has never seen one whom he would desire to put in charge of an important executive division. Their defects were want of energy and power to control their subordinates and want of readiness to accept responsibility. These defects he attributes not actually to their Asiatic origin but rather to their early training. If a Native were sent to an English public school for two or three years and then passed through Cooper's Hill, there is no reason why he should not make a good Engineer. A man educated in Madras, whether domiciled European, Eurasian, or Native, would be unlikely to succeed as an executive officer. Very high education is required for the work of the Department and a higher degree of technical skill than would be necessary in a Local Board Surveyor in England. There is a good deal of administrative work also for which qualifications are required,—*e.g.*, the power of being on equal terms with officers of other Departments so as to avoid friction and awkwardness. An executive officer in the Irrigation Branch has often to discuss and advise the Revenue Department on important questions, such as water rates. Every man in the superior grade should be appointed in England. Promotion from subordinate to superior grades should be so exceptional that provision for it could not be made beforehand. Witness knew only one upper subordinate in all his service whom he would promote to superior grades; as a rule, by such promotions a good subordinate is spoiled and a bad Engineer made. Their incapacity is not for the grade of Assistant Engineer, but for the higher offices for which that grade is a training ground, and their promotion to that grade without further prospects would be injurious to the service. Military subordinates are the backbone of the subordinate establishment. They have a better sense of discipline,—*i.e.*, not only obeying orders, but the practice of working in concert with others, and a sense of responsibility as members of an important organisation. They may not be absolutely necessary, but when promptitude or hard work of a man who will stick to his work are required, there is no man like a military subordinate. But the witness has not an unfavorable opinion of the other three groups (civilian Europeans, Eurasians, and Natives) which make up the subordinate service. He has a high opinion of them all as a body, and has known excellent service done by many others than military men, though on the whole he considers the latter the more efficient. Colonel Pennycuick does not approve of, or think fair to the other members of the Department, the system under which a European soldier comes in as a 1st grade Overseer.

Mr. Claude Vincent, C.E. (Cooper's Hill), *Executive Engineer, Buckingham Canal Division; 13 years' service.*—has served in district work and also as Under-Secretary to the Madras Government, and has frequently been an Examiner in the Engineering College. He thinks Natives unsuitable for the work required of Engineers. A good Engineer should be active, fond of riding, indifferent to the sun, inured to exposure, prompt at arriving at a decision and not afraid of responsibility. From constitutional and ethnological reasons these qualities can be looked for only in exceptional Natives. There are excellent Native subordinates in the Department, but they have, as a rule, only one work or groups of works to look after, and are not often expected to act on their own initiative. Even if such men were generally available it would be impossible to educate them in India up to the required standard,—that for instance of Royal Engineers or Cooper's Hill. The tuitional staff in England are men of European reputation.

India.
P. W. Department.
Section

The best Royal Engineer and Cooper's Hill men will always be ahead of the best Rurki men, and the training at Rurki is superior to that given at the Madras Civil Engineering College, as there are large irrigation works and workshops close at hand in which to teach the students practical work. Mr. Vincent thinks that it would be a most excellent thing to have separate agencies to carry out the ordinary works of a district and works of extraordinary importance. At present men in the Department who are fond of Engineering have their enthusiasm spoilt by having to do a great deal of petty work. He disapproves of the system of giving one Engineer appointment annually to the senior Native student of the Engineering College who obtains the University degree of Bachelor of Engineering. It is a chance whether the student so selected develops into a capable Engineer, and it would be a better plan to make such an appointment annually from among the Native upper subordinates whose capacity can be accurately gauged and who sadly require a little stimulus to their zeal. Their promotion is very slow owing to the system of bringing in military men as 1st grade Overseers, and the higher grades of the upper subordinate establishment are almost wholly closed to them. Domiciled Europeans take advantage of this system by enlisting and spending six months in a British regiment and then seeking admission to the College. There should be separate promotion lists for military and civil subordinates. The objections made on physical grounds to employ Natives as Engineers would not apply to Eurasians, but would apply to domiciled Europeans who do not enlist.

Mr. S. D. Pears (Cooper's Hill), *Executive Engineer; 7 years' service*—has had experience of Bachelors of Civil Engineering employed as Supervisors. Their book knowledge was good, but as Supervisors they were above their work. They had no idea of discipline; they failed in designing. Until they had two or three years' practical experience they were not of much use. At construction they could not correct a mistake they saw a brick-maker make; in survey work they varied very much. One of them was the best man witness ever came across for laying out distributaries, but he could not design sluices or bridges. The European subordinates were in witness's experience not so good as Natives. They were inferior to Natives in the command of labour. If a hundred coolies were required at an hour's notice a Native subordinate could get them, a European could not.

Rai Bahadur Subharaya Chariyar, B.C.E., *Executive Engineer; 22 years' service*—had some Cooper's Hill Engineers serving under him temporarily. Saw them on three occasions in three months. They appeared rather inexperienced, had been in the country only four or five years, and in witness's opinion were put in charge of subdivisions too early. It takes a young Engineer two years to become thoroughly efficient. Witness has never met any Cooper's Hill men who were good vernacular scholars, and in his opinion a good command of the vernacular language is essential to efficiency. Witness was kept on probation for six years after he entered the Public Works Department before he was appointed an Assistant Engineer. An order was passed that he should enter the Department in the subordinate grade, but the rule was not enforced in the case of Europeans.

Rai Sahib Ratnasabhapati Pillai, B.A., B.C.E., *Assistant Engineer, 1st grade; 13 years' service*—thinks that the treatment of Europeans and Natives is not always equal. Was superseded temporarily on several occasions, on one of them in consequence of a Government order by which three months' grace was given to persons to pass the vernacular examination.

Mr. B. Stephens, *Local Fund Engineer, Coimbatore District*—was formerly an upper subordinate in the Public Works Department, but left it in 1879 when there were reductions. Is of opinion that promotions should be made more frequently from the upper subordinate to the Engineers grade in order to secure the best local talent. The great bulk of the work done, he remarks, in the Department of Public Works is of such a nature as not to require a highly scientific training. The bulk of the work to be done is almost entirely confined to estimating and measuring earthwork for tank and channel repairs. During the last ten or fifteen years there has hardly been one work done by the Department of Public Works that an experienced Supervisor or Sub-Engineer could not have designed or executed. Mr. Stephens gives instances in which he was superseded in important charges by men of less professional experience and ability which led to his leaving the Department in disgust. He also points out that civil are superseded by military subordinates without reason. There should be fair play between them, and the higher grades should be opened out to deserving men without reference to caste, colour, or creed.

Mr. Vaithianatha Aiyar, B.A., B.C.E., *Sub-Engineer*,—entered the Department in the subordinate grade in 1876, having adopted Engineering as his profession by the inducement of being admitted to the Engineering establishment. Has memorialised unsuccessfully respecting the direct appointment of a student from the College as an Assistant Engineer and claiming the appointment himself.

The changes he advocates in the organization of the Department are as follows:—

(1) that all Overseers should be Natives, as these have to deal directly with workmen and ryots;

(2) that all Bachelors of Civil Engineering should enter the Department on probation as Engineers;

(3) that the Cooper's Hill College should be closed as far as India is concerned;

(4) that persons qualifying themselves for service in the Public Works Department should also be employed in the Survey Department;

(5) that subordinates of proved merit and experience should be admitted into the Engineering establishment;

(6) that the Classified List should be published according to rank in order that every member may know his relative position in the Department.

The duties of the Department in Madras require constant travelling, a knowledge of the vernacular and customs of the people, and the requirements and available resources of the country, and in all these points Natives are likely to be more efficient than Europeans.

Mr. J. W. H. Ellis, *Honorary Assistant Engineer, 1st class*—entered the Department of Public Works in October 1861 as an Assistant Overseer on a salary of R80; considers that the Cooper's Hill College is not necessary for India, and that the Indian Colleges can train men of sufficient attainments and that the standard should be raised if possible. Eurasians labour under a disadvantage in not being regarded as "pure Asiatics." He believes that this was the cause why the Government of India refused to accept the recommendation of the local Government to promote him and another Eurasian gentleman to permanent Assistant Engineerships, though they have been required to discharge the duties of the higher grades as occasions required. Mr. Ellis gives numerous instances of this from his own service. The prospects of civilians in the subordinate grades are bad as compared with military men. They must enter as Overseers of the 3rd grade, while military men enter as 1st grade, and have no appointments guaranteed to them, while military men are guaranteed their appointments irrespective of their place in the list.

Mr. S. Subramanya Sastri, *2nd grade Overseer*—complains of there being only one guaranteed appointment per annum to the Engineers grade, and that in spite of a guarantee in 1872, men were appointed only in 1874, 1880, up to 1885. Since then there has been one appointment annually. He also objects to the unfairness of bringing in Military Overseers in the 1st grade. Native Overseers thus find themselves with the lapse of every year further and further from the rank of Supervisor, and the scope of first appointment to the Native students becomes more and more curtailed. Witness proposes that only two military men should be appointed annually, and that they should begin as 3rd grade Overseer, but with a higher rate of pay than Natives. The remaining vacancies should be filled by Assistant Civil Engineers and Bachelors of Civil Engineering. Native Overseers should at first be employed as draftsmen in the divisional offices, but in a few instances as Sub-Overseers, and the special Department of the College for draftsmen should be abolished. Overseers and officers drawing small salaries should not be transferred out of the circle, and temporary establishments should not be employed in the execution of works, but in the preliminary operations of preparation of the projects as the Department has no hold over them in case of bad work.

Mr. A. M. Mauriapa Mudaliyar, *late temporary Sub-Engineer*—has served for some 26 years in different capacities in the Public Works Department on the South Indian Railway, and famine relief officer. He has been promised a suitable appointment in the Public Works Department when his private business, which at present compels him to remain at Madras, allows him to take it up. He considers that there should be an increase in the staff of permanent lower Sub-Overseers, and that the most honest of them should be promoted to upper subordinate grades, and if qualified to that of Assistant Engineer. At present those who come out of the Engineering Colleges with Overseers' and Assistant Engineers' certificates are not fit to be entrusted with Overseer's work. They do not care to submit to discipline and to learn work. All who pass for Assistant Engineer should be made to join as 3rd grade Overseer on one year's probation, and when proved to be honest, active, indefatigable, and willing, should be confirmed and allowed to rise to the upper subordinate grade, from which those who are resourceful under difficulties, prompt at coming to a decision, thoroughly qualified in almost all branches of Engineering work, not afraid of assuming responsibility, and above all perfectly trustworthy and honest, should be promoted to the Engineers or officers' class. In his experience witness found officers of Royal Engineers the best and Cooper's Hill Engineers next to them. All the European officers he knew with two exceptions were honest and painstaking, their only drawback being that they always kept the Natives at a distance. Almost all the Engineering works in this country could be done as efficiently by Natives trained out here as by Engineers trained elsewhere, but he would bring out Engineers from England for the sake of the higher moral tone they give.

Mr. S. Narayanaswami Chetty, *District Court Pleader, Municipal Councillor, and Member, District Board, Vellore*—would create a separate service for graduates, which they might enter on higher pay, and from which they might be promoted to vacancies in the higher grades, if found deserving. The men who having passed through the College enter as Overseers in consequence of there being only one Engineer appointment become discontented, work without heart, and seek for employment elsewhere. Natives should be employed in all grades of the Department up to, for the present, that of Superintending Engineers or Engineers in charge of special projects requiring extraordinary skill and experience.

Mr. A. Narayn Swami Mudaliyar, *Supervisor, 1st grade*—objects to the admission of military subordinates as 1st grade Overseers and of Engineering graduates as 2nd grade Supervisors, as being a great obstacle to the promotion of deserving Overseers who enter in the lower grades. Witness entered as an Overseer of the 3rd grade (R60) in 1867, and is now only a Supervisor, 1st grade (R200), though he has been for five years in charge of a subdivision.

Accounts Branch.

The establishment in this branch consists of two classes, the superior and the subordinate. The superior Accounts Branch employs seventy-two officers, amongst whom there is only one Native

of India of unmixed blood. Seventeen Officers are Europeans domiciled in India and fifty-four are Europeans not so domiciled. Ten are Royal Engineers, five other military officers, two Stanley Engineers, eleven Cooper's Hill Engineers, and forty-two non-professional civilians.

The head of the branch is the Accountant General, a Royal Engineer. The pay of this officer is R2,500. Next come Examiners of Accounts in four classes, the lowest of which is subdivided into three grades. The pay of Examiners ranges from R650 to R1,600. There are two grades of Deputy Examiners on R450 and R550, and two of Assistant Examiners on R250 and R350. Apprentices draw R100. Royal Engineers as in the Engineer establishment draw the net military pay of their rank in addition to the consolidated pay of the office they hold in the branch, or what is known as the staff scale in lieu of the consolidated pay which varies with the rank of the officer.

This branch is recruited (1) by appointments from the Engineer establishment in any grade; (2) by the appointment as Apprentice Examiners of candidates who pass a prescribed educational test; and (3) by promotions from the subordinate class of Accountants who pass the same test except in languages. Government reserves to itself the right of appointing qualified outsiders. Assistant Engineers when appointed to the Accounts Branch must pass a special examination in accounts and departmental procedure before confirmation. Outside candidates, nominated by the Accountant General, must undergo an examination conducted by the Principal of the Rurki College. The fact of passing gives no claim to an appointment. Those who pass are appointed only as vacancies occur. When appointed they serve as apprentices on probation for at least six months until reported efficient. If an apprentice fails to become efficient in two years he is not retained. He must also pass a prescribed examination in book-keeping and departmental accounts. Accountants promoted to the superior establishment on account of long and meritorious service are warned that they must not expect promotion above the lowest grade of Examiners. Promotions are made in the superior grades on a single list, recommendations being made by the Local Governments respecting officers serving under them.

The Public Works Department Code lays down (paragraph 117) that an Examiner of Accounts has two distinct functions—

(*a*) as Financial Assistant to the Secretary to Government or head of a State Railway;

(*b*) as independent Auditor on behalf of the Government of India.

It is his duty to audit the charges for expenditure incurred by all disbursing officers, to supervise the keeping of the accounts of all Public Works Department receipts and expenditure according to the prescribed forms, and to maintain regularity in the financial operations of the Department (paragraph 141). In respect of one division of his functions he is to exercise them under the orders of the Local Government or head of the Railway to which he is attached, and in regard to the other he is under the immediate orders of the Accountant General.

Subordinate Accounts Branch.

This consists of four grades of Accountants 479 in number on pay rising from R80 to R450. There is a fifth grade in the Madras Presidency, but as its maximum salary is only R75, it need not be taken into account. There is only one European not domiciled in India in the Subordinate Accounts Branch.

The domiciled Europeans including Eurasians are	179
Hindus number	270
Mahomedans	3
And other Natives of India	16

Appointments are made to the subordinate Accounts establishment by the Accountant General, Public Works Department for vacancies in Military Works and Railways and smaller Local Administrations and by Local Governments for vacancies under them.

The men appointed must be—

(*a*) Outsiders who have passed a test examination held every alternate six months by the Thomason and Seebpore Colleges, or

(*b*) Men already in Government service who have passed this examination, or

(*c*) Upper subordinates from the executive branch, the examination being dispensed with in the case of those who have proved their aptitude for accounts work, or

(*d*) Candidates who have passed the Entrance examination to the Engineer class of the Thomason College, and who are exempted from the preliminary examination.

After appointment every Accountant will be on probation for a year, and before being confirmed must be reported qualified and pass an examination in the divisional accounts of one section of the Department. A further departmental examination must as a rule be passed before an Accountant can be promoted to the 2nd grade. When the examination is dispensed with the appointment can be made only by the Government of India. Promotions are made by the Local Governments of Bengal, North-Western Provinces, Punjab, and Madras on separate lists.

By the Accountant General lists are kept also for—

(*a*) The smaller Administrations, Military Works, and Office of Accountant General:

(*b*) Railway Branch.

The tests for appointment and promotion given above do not apply in Bombay, where the Local Government has its own rules for appointment and promotion.

The leave and pension rules of this class are those of the Uncovenanted Service. Service before 22 years of age does not count for pension.

The technical requirements of this branch are thus given in the Secretariat note of the Government of India:—

"For the superior officers of the Accounts branch a complete knowledge of commercial accounts and book-keeping, and of the departmental systems of the several branches, General and Railways, including open line and store accounts, is requisite; also a complete knowledge of arithmetic and elementary algebra, geometry, and mensuration. A knowledge of pure mathematics, extending to the higher branches of the subject, is useful but not essential; but it is now being considered whether the test should not be considerably raised so as to obtain the entertainment of men of higher education. In the highest posts of the Department it may be said that an officer should be a competent professional Accountant in the technical sense, which includes a knowledge of banking and commercial business. He should also possess a fair knowledge of actuarial science, extending to a practical acquaintance with the various tables used by actuaries and the mathematical formulæ on which they depend, together with an acquaintance with the simpler problems dealt with. At the same time he must have a thoroughly practical acquaintance with the several systems of accounts of the Department and the numerous Codes of the Public Works and Financial Departments. For the higher Accountants a good knowledge of arithmetic, elementary algebra, mathematics, and book-keeping is necessary, an acquaintance with the several departmental systems of accounts is desirable, and an intimate knowledge of at least one of the systems is indispensable. For the lower Accountants a fair knowledge of book-keeping and a good practical knowledge of one of the departmental systems is sufficient."

The general duties of an Examiner of Accounts and the routine of an Examiner's office are thus described by Lieutenant Hilliard, R.E., Deputy Examiner, Punjab:—

"The duties of an Examiner of Accounts are generally to check the accounts sent in by the Divisional Engineer officers, and keep a general watch over their operations: for instance an Examiner has to superintend the fixing of rates by the Divisional Engineer. He has to audit the pay of the various Public Works Department establishments and decides all accounts questions connected with their pay and leave. The SubDivisional Engineer officer makes out the monthly accounts of work which are then collected together in the Divisional office; from the Divisional office they go up to the Examiner's office to be checked. It is, therefore, of advantage to the Examiner to know from personal experience how these sub-accounts are made out.

"The Examiner is a controlling officer. When the accounts are received in his office they are handed over to the Assistants of the Accountants, who compare the vouchers with the amounts entered in the different schedules of expenditure, &c. The figures taken from these schedules are all checked and entered up in the Examiner's books, from which he is enabled to keep on record the expenditure on any sub-head of work up to date. From the checking clerks the accounts go to an Accountant in charge of three or four divisions who again checks them. From him they go to the Superintendent of the branch. He has to go over all the accounts of his sections, and from him they go to the Deputy Examiner in charge of the branch, who is finally responsible for their correctness."

The evidence as to the larger employment of Natives among the superior officers of the Accounts Branch is not unanimous, but several witnesses consider that there is no reason why this should not be carried out if educated Natives could be attracted to the Department. The uncertainty of the appointment of a nominee who may pass the qualifying test and the necessity for knowing something of Latin, French, or German practically exclude Natives of the class required, and the fact that while 20 Europeans have been promoted from the subordinates grades, only one Native has been so promoted, indicates a preference on the part of the heads of the Department for European agency. The unfavorable characteristics of Natives which have been remarked on by the witnesses respecting the Engineers Establishment are here also dwelt upon by some witnesses, but it is allowed that Natives in the grades are quick workers and good at figures, and that some of them are competent for the duties of Deputy Examiner.

The employment of Engineers is advocated by the Accountant General and other officers on the grounds that their professional knowledge, if not essential, is of great use in enabling them to deal with the accounts of the executive officers, and that they work more smoothly with the Departments with which they are brought in contact. A strong opinion is also expressed as to their superiority, as a class, to the civilians employed in the branch and without them Colonel Filgate thinks that the superior establishment could not be manned. On the other side opposition is expressed to the employment in this branch of professional Engineers, and especially Royal Engineers, as unnecessarily expensive and injurious to the efficiency of Royal Engineers as soldiers. The same would apply also to the few Staff Corps officers in the branch.

The civilian officers examined object to the inviduous distinctions as regards pay, pension, and furlough between different classes of officers in the branch.

In the Accountant's grades, it is recommended that the service should be localised. Natives are averse, as a rule, to being sent away far from their home, and better men would be attracted to the Department if the present system were altered in this respect.

India.

P. W. Department.

Section I.

The evidence of the witnesses may be abstracted as follows—

Colonel Filgate, R.E., *Accountant General; 24 years in the Department*—of the different classes of officers employed in the superior establishment of the Accounts branch, prefers officers from the Engineers to outsiders, and considers that without them he could not officer the branch. There is less friction with other Departments when Engineers are employed and their average efficiency is greater than that of the civilian officers. A technical knowledge of Engineering is not essential, but is useful for an officer in the branch. The employment of some Royal Engineers is unavoidable, as the Royal Engineer establishment for India is fixed and work must be found for the officers. The civilians who seek employment in this branch are men who have failed for other Departments, and come to Accounts as a last resort. Cooper's Hill Engineers pass the departmental examination in one year; civilians take two or three years, and can then barely scrape through. Two or three have failed altogether and would not learn. These remarks refer to the average. There are some uncommonly good men among the civilians. Only one Native is employed in the superior grades. Colonel Filgate prefers Europeans, and thinks that in regard to Divisional offices, those of Executive Engineer could not be satisfactorily inspected by Natives, but if equally efficient men could be obtained locally on less pay, he would have no objection to their being more largely employed. He would, however, always have a proportion from the Engineer branch to prevent friction, and as financial advisers of Government. Promotions should be made from the subordinate grades only of selected men. The Native above referred to was so promoted owing to his being a specially good Accountant. A man may be a first-class Accountant and yet not fitted to be Deputy Examiner. The witness has no objection whatever to the introduction of competitive examination for admission to the lower grade. In Bengal the system of such an examination has been tried after the men have undergone a period of probation.

Mr. R. G. Macdonald, *Examiner, 2nd class, and Deputy Accountant General*—has had four years' service in the subordinate and nineteen years' service in superior grades and considers that a knowledge of Engineering is an advantage, but is not essential for service in this branch. Sufficient general knowledge of the subject can be acquired without undergoing the professional training of an Engineer. Of the various classes of officers the good men of each class show equal ability. Promotions should be made from the inferior grades in cases of exceptional merit. The witness knows of 20 good men who were so promoted. The men wanted are of the stamp of those entertained by the Bank of Bengal as its Agents. Natives might be more largely employed in the superior grades, and some of the appointments thrown open to competition in India.

Mr. E. P. Quinlan, *Examiner of Accounts, 3rd class Eastern Bengal State Railway*—considers that there is no reason why the duties of a Deputy Examiner should not be performed by a Native. The class of Native which have hitherto been attracted to the branch do not possess the necessary education to fit them for the headship of an important office. The Head Examiner is intimately connected, both officially and personally, with the heads of other Departments, and takes part in meeting of such officers, when questions are discussed which very intimately affect the personnel and staff, and has also the conduct of the important correspondence which goes on between the heads of Departments and Boards of Directors in England. Strength of character and capacity to control men are wanted as well as book knowledge. The Accountants appointed from the local Parochial Schools, not Colleges, European and Eurasian, have not turned out well. They are generally lazy, useless, and indolent. Natives are preferable to work with. There is a want of energy in Native B.As. employed in the office. Of five, two are doing fairly well, but three have been useless because they would not undergo the labour required of them. There are invidious distinctions in the leave rules between different classes of officers, and the frequent transfers in the branch are a disadvantage.

Mr. J. B. Braddon, *Examiner, 4th class, 2nd grade, Bengal (15½ years' service in the Department, 13 in superior grades)*—has served in most parts of India—Secunderabad, Kathiawar, Rajputana, Cawnpore, Lahore, Sukkur, Bombay, and Calcutta. For service in superior grades Mr. Braddon considers that besides grasp of details and administrative ability, officers should have previous training in Accounts if possible. The employment of Royal Engineers is not conducive to efficiency as they have had no such training and their tenure of office is understood to be only temporary, but for the higher grades of the Department Europeans are necessary. The disabilities of such Natives as seek admission to the Department are—

(*a*) Want of administrative ability,

(*b*) Caste prejudice,

(*c*) Difficulties which would arise in personal communications with European officers,

(*d*) Lack of confidence in the impartiality on the part of their subordinates.

He can call to mind only one Native in the subordinate grades whom he would consider fitted for the responsibilities and equal to the requirement of the superior grades. There is no reason against the admission of Native gentlemen to the higher grade if they can be induced to enter. Their capacity for Accounts, their steadiness and studiousness, render them particularly fitted for this; what is wanted in addition is integrity, also self-reliance. For the subordinate grades there are advantages and disadvantages attached to the employment of Europeans and Natives, including Eurasians. Europeans have greater stamina and pluck, higher intelligence in general subjects, and greater fitness for control of subordinates, but they require higher pay, better house accommodation, and more furlough. Eurasians can be had on lower pay, are as a rule good at figures and clerical work, and are amenable to discipline. They are, however, of sickly constitution, have little influence over others, and want strength of character. Natives are quick workers, and require lower pay and no furlough, but they are unwilling to be moved about the country, have a tendency to a mechanical way of doing work, and are influenced

by race feelings. The distinctions of pay, pension, and furlough between different classes of European officers all doing the same work should be removed. Natives admitted to the superior grades should be satisfied with lower remuneration, less furlough, and smaller pensions than are given to Europeans. The subordinate establishments should be localised if possible.

LALA RAULLA RAM, *Honorary Assistant Examiner, Bengal*—thinks that appointments in the superior Accounts Branch should be thrown open to public competition. The present examination is not open competition and the present mode of recruitment is not satisfactory. Honorary rank is justly suspected of being intended to choke off the demands of the subordinate servants for promotion to the superior grades and to the grade of Engineers. If the subordinates are considered fit for the rank, they should be considered fit for the office.

COLONEL PARRY LAMBERT, R.E., *Examiner of Accounts, Punjab*—thinks that Engineers are very necessary in the Accounts Branch as they know the difficulties there are in making up initial accounts, and for this reason can audit more sensibly, and not make frivolous objections. Non-professional Deputy Examiners, however, do their work well, and the predecessor of the witness in his present office was not an Engineer. Natives might be made Assistant Examiners and Deputy Examiners, but do not possess sufficient authority to be in charge of a large office or to deal with large bodies of men. There is one Native Accountant in the office at present who would make a very good Deputy Examiner. Employment in the lower classes of the superior grades is very good training for young Royal Engineer officers. They should, however, revert to the Engineering branch and be permanently employed there.

LIEUTENANT HILLIARD, R.E., *Deputy Examiner, Punjab*—has been three years in the Accounts Branch and considers that for service in the branch a good mercantile education is required, certainly not an Engineering one. The duties of the superior and subordinate grades differ in degree rather than in kind. Educated Natives do not come forward for examinations for the superior grades, and present subordinates are not sufficiently educated for the higher grades. In the subordinate grades, Natives are more painstaking in checking minute details than Europeans, and are good mental calculators. Europeans show greater breadth of character. Accountants should be localised.

PANDIT PREM NATH, *a Kashmiri Brahman, educated at Lahore, entered as an Accountant of the lower grade 20 years ago, and is now the only Native of India in the position of an Examiner of Accounts.*—Thinks that a knowledge of Engineering is not necessary for the work in the superior grades, and that better men would be obtained in the branch if these appointments were thrown open to Natives. A good general education, knowledge of accounts and tact in controlling the work of European officers are all that are required. Would substitute Persian, Arabic, and Sanskrit for the languages (Latin, French, and German) now entered in the list of subjects for examination.

MR. A. H. TEN BROEKE, *Honorary Assistant Examiner*—thinks that Deputy Examiners should be appointed more frequently from the Accountant's grade, in accordance with Chapter II, paragraph 59, Public Works Department Code.*

* Deputy Examiners will be appointed from—
(1) Executive Engineer.
(2) Assistant Engineers.
(3) Assistant Examiners, 1st grade.
(4) Accountants, 1st grade.

The following opinions respecting the Accounts Branch have been given by witnesses serving in other branches of the Department.

GENERAL BROWNE, R.E.—is opposed to the employment of Royal Engineers in the Accounts Branch and considers it disastrous to the efficiency of the army. The military education of officers so employed is wasted and they are spoiled as Engineer soldiers. He would subdivide the branch into two, one in which Engineer officers are not required. This would include military works, where lists of works are carefully estimated for, and all arranged in order of urgency, where what is likely to happen can be foreseen for perhaps three years, and also ordinary civil works. The other would include important works, such as great roads, railways, and canals, in which the assistance of skilled Engineers must be called in to keep the accounts. Unskilled Engineers would make most astounding blunders of all kinds from sheer want of comprehension of ordinary Engineering details. General Browne, in support of this, states that a roadway girder worth about R60, lost in a flood, was charged as a whole girder span worth R25,000, and was for months gravely debited to a bridge till an Engineer looked at the accounts and detected at a glance a bungle which a whole army of accountants (non-professional) would never have found out.

MR. BUCKLEY, whose evidence also has been given regarding the Engineering Establishment, is opposed to the employment of Royal Engineers in the Accounts Branch, and thinks that though technical experience might have a tendency to be useful there, it is not worth paying for it the price now paid.

COLONEL ROBERT HOME, *Inspector-General of Irrigation*—considers that some general knowledge of Engineering is necessary, but not training as an Engineer. An Examiner absolutely ignorant of Engineering is likely to get into difficulties.

RAO BAHADUR KASHINATH RAM CHANDRA GODHALE, *Executive Engineer, Bombay*—is of opinion that Native agency should be more largely employed in the branch. No high professional training is necessary, but an Examiner ought to know the nature and value of materials required for works.

MR. PANDURANG RAMCHANDRA DESAI, *Pleader in the District Court at Thana, Bombay*—advocates the employment of Natives who have served in similar branches of other Departments instead of

Europeans in the Accounts Branch of the Public Works Department, on the ground of their accuracy and quickness in accounts and of their proved efficiency in this respect.

MR. W. CRISP, *Deputy Examiner, Bombay; nearly 20 years' service*—considers that no Engineering knowledge is required for discharging the duties of the Accounts Branch, and that they could be carried out as well by civilians as by military men who draw higher pay. He would recruit the superior branch by selection with an educational test and would admit also Accountants already in the Department on account of superior merit. He would like a larger admixture of Europeans than there is at present among the Accountants, and would not recruit the latter as is done at present from the clerical establishment. He would have one general list of Accountants for all India to regulate promotion, and brings to notice the disadvantage in the matter of pensions under which the civilian officers of the superior establishment labour as compared with the Engineers who belong to it.

MR. J. O. WREDDEN, *3rd grade Accountant*—complains of a rule lately prescribed by which officers of his grade must pass in certain subjects before promotion and states that Native Accountants do their work satisfactorily but are slower than Europeans.

COLONEL PENNYCUICK, *Superintending Engineer, Trichinopoly Circle*—would separate the Accounts Branch altogether from the Department, but if the present system is maintained, thinks it almost necessary that the Examiner of Accounts should be an Engineer,—*i.e*, a gentleman possessing technical knowledge and belonging to the same Department as the Engineers whose accounts he is to examine. The Examiners have to deal largely with Engineering matters and to discuss them with Engineers. They should be able to understand the reasons for things.

MR. W. D. CALDER, *Accountant, 1st grade, born and educated in India*—considers that Cooper's Hill men should not be appointed to the branch as no knowledge of Engineering is required. He would abolish nomination and throw appointments open to competition. He objects also to the rule which bars an Accountant promoted from rising to a higher post than that of Examiner, 4th class, 3rd grade, the effect of which is to prevent meritorious Accountants from rising. He would not exclude Royal Engineers altogether as they help to give the Department a tone. As a body, the Accountants are not sufficiently educated for the upper service and very few of them are fitted to be so promoted. It is absolutely necessary that there should be a superior and subordinate establishment. And Apprentice Examiners are not necessary.

MR. J. CONQUEST, B.A., *Accountant, 2nd grade*—is of opinion that the appointments ought to be thrown open to competition instead of being given as at present by nomination. The present examination is unfair to Natives as requiring a knowledge of Latin, French, or German; and instead of Hindustani, a candidate should be allowed to select any Indian language; a graduate who has to pass a more severe examination might be exempted. Engineering knowledge is not required, and the appointment of Cooper's Hill men and the higher pay they draw are objectionable as preventing the advancement of qualified Accountants. He objects also to the rules barring the progress of promoted Accountants beyond the general grade of Examiners, and considers that there should be a superior and subordinate establishment, and that as a body the Accountants are not fit for promotion to the superior rank. He would select and also appoint outsiders. He has a general impression that there is a prejudice against promoting Eurasians to the superior grades, but knows of one who applied for a nomination as Apprentice Examiner and got it. Natives are slower than Europeans and Eurasians and require more teaching, but will stick to their work longer. The fifth grade of Accountants, which is peculiar to Madras, is so badly paid—R30 on probation—that it will not attract the best men.

MR. A. MAURIAPA MUDALIYAR, *late temporary Sub-Engineer*—considers that the Accounts Branch should have an Engineer officer at its head as so many matters connected with that profession must be dealt with. He should be able to judge whether the charges on the vouchers are proper.

MR. NARASINGHA RAO, *Accountant, 4th grade, joined the Department as a probationer Accountant in the 5th grade in 1877, but has not yet risen beyond the 4th grade, R80 to 150, as he has not yet passed the examination; has no University degree, only matriculated.*—Thinks that few educated Natives seek admission to the Department as Book-keeping and Mensuration have been added to the subjects for the test examination. Another reason is that graduates in Southern India do not as a rule write a good hand, not having been trained to it in their College course, and fail in the examination or stay away as they have no hope of succeeding. The pay—R30 or R40—is not sufficiently attractive, but there are three B.As. in the 5th grade at present. This witness complains of the slowness of promotion owing to the proportions of higher appointments being adjusted on a different principle from that of the upper subordinates. And he objects to the practice of transferring Cooper's Hill Engineers from the Executive to the Accounts Branch as prejudicial to the just aspirations of Accountants.

State Railway Revenue Establishment.

The State Railway Revenue Establishment is engaged wholly on open lines of State Railways. The superior and a portion of the subordinate establishment is included, like the rest of the establishments above enumerated except the lower subordinate, in the classified list of the Department, but there is a large staff of subordinate employés numbered by hundreds which finds no place in the classified list. This consists of engine-drivers, mechanics, guards, station-masters, and others. They cannot be classified by grades, and those appointed since September 1881 are non-pensionable. Such of them as have not covenants are liable to dismissal at any time with short notice; their appointments are sanctioned on half-yearly authorization rolls which are submitted by each Railway Administration to the Government of India or the Local Government.

Superior Revenue Establishment.

16. The superior establishment comprises the following departments of Railway work :—

The Manager's Department.	The Locomotive.
The Traffic.	The Storekeepers.

The Paymasters.

Appointments to the higher grades of the Manager's Department are generally made from amongst selected members of the Engineer establishment, who have been engaged on Railway work. At the commencement of open-line operations experts in traffic management and locomotive work were introduced in considerable numbers from the guaranteed companies and other sources, and this practice still continues to a certain extent, especially when any of the guaranteed companies, as recently the Sind, Punjab and Delhi Railway, are absorbed into the State system. Many of the men in the Locomotive Department were brought out originally under covenant with the Secretary of State, and are still so brought out inasmuch as qualified Mechanical Engineers are rarely to be found in search of employ in the country. The ordinary sources of supply for this establishment at the present time may, however, be classified as follows :—

(1) Selection from officers of the Engineer and superior Accounts Establishment (chiefly for the higher grades of the Manager's class).

(2) Appointment by the Secretary of State, generally under short covenants, of qualified professional men (this is almost entirely confined to the Locomotive Department).

(3) Nomination by the Government of India of candidates or apprentices in India, who after a period of promotion and passing certain tests are eventually appointed to the lower grades. (These appointments are generally in the Traffic Department, but a few have been made in the Locomotive Department.)

(4) Appointments from the two upper classes, G and H, of the subordinate establishment.

Persons appointed in the candidate class of the Traffic Department have to serve on probation for a period which may extend to two years of approved service after attaining the age of 20 years. Before promotion to class IV, they have to pass a professional examination in departmental work, including a knowledge of the Revenue Code and Traffic Manual and in the vernacular by the lower standard. Appointments to the Locomotive Department, as already stated, are generally made from men trained in locomotive workshops in Europe, who are sent out under three years' covenants with the Secretary of State and can extend their service after expiry of covenants. Candidates who have served 5 years in some locomotive workshop, either in India or England, are also occasionally appointed in India on probation to the lowest class of the State Railway Superior Revenue Establishment. The officers in this branch are graded into one special class, and four others of which the first contains three grades. The pay of these several grades and classes ranges from ₹250 to ₹2,500. These classes are divided between the Management, the Traffic Department, and the Locomotive Department. Government reserves the right of appointing qualified officers in any class. Promotions in them are made by the Government of India on the same principles as in other superior establishments.

Including 3 candidates on pay rising from ₹70 to ₹100, there are altogether in this branch 125 officers, of whom 91 are Europeans not domiciled in India, 28 are domiciled Europeans, 5 are Hindus, and 1 is a Native Christian or Parsi. The leave and pension rules of the Uncovenanted Service apply to all pensionable members of the superior State Railway Service who are not Royal Engineers or Chief Engineers.

The subordinate Classified State Railway Establishment comprises—

Inspectors of Maintenance,
Station Masters,
Carriage Inspectors,
Traffic Inspectors,
Sub-Storekeepers,
Assistant Foremen,
Chief Clerks of Locomotive and Traffic,
Paymasters.

Appointments are made to these offices by the Managers of the several Railways, who are responsible that the men are competent, and by them also promotions are made within the limits of the sanctioned scale for each Railway.

Of one hundred and ten classified appointments of this nature with emoluments rising from ₹240 to ₹400,—

33 are held by Europeans not domiciled in India,
74 are held by Europeans so domiciled,
2 are held by Hindus, and
1 is held by a Native of some other religion.

The leave and pension rules applicable to this class also are those of the Uncovenanted Service Service before the age of 22 does not count for pension.

The technical requirements are thus stated in the Secretariat note :—

"For the Traffic Department a fair knowledge of Accounts and a thorough knowledge of the Traffic accounts of the State Railway Revenue System is necessary; also a thorough practical acquaintance with traffic work. It is considered that any person with a fair general education and of business habits, and with the necessary personal qualifications for enforcing authority, would make, with proper training, a good Traffic officer. For the Locomotive Department the training of a Mechanical Engineer, according to the English system, is essential, and for this reason the Locomotive Department consists almost entirely of men so trained. It is possible for youths of fair education, and with a bent for mechanical engineering, to obtain the necessary qualifications in the Government workshops; and the rules are framed to allow of admissions in this manner. The qualifications for the subordinates of the State Railway Revenue Department depend, as in the case of the superior officers, on the branch of the Department to which they belong. For the Engineering Department the qualifications are the same as for the upper subordinates of the Engineer establishment. For the Traffic Department the same qualifications, in somewhat less degree, are necessary as are required for the superior officers. For the Locomotive Department a man must be a practical mechanical artificer, trained either in the Indian workshops or sent out from England."

Major Boughey, R.E., *Manager, Eastern Bengal State Railway*—refers in his evidence to a Resolution (therein quoted) of the Government of India, Public Work Department, of 10th November 1879, directing all State Railway Administrations to keep in sight the importance of a larger infusion of Natives into the higher ranks of the Traffic Department, which it was stated could only be done by inducing young men of fair education and of a class corresponding to that of the Europeans employed in the Department in question to train themselves in the required duties by serving in the lower grades. Active habits and good constitution were said to be as essential for the efficient performance of the duties of a Traffic officer in the higher grades as a knowledge of English and Accounts. Native Traffic officers should also, it was ordered, be of a social status sufficient to command the respect of their subordinates. The Resolution concluded with an intimation that all posts in the Revenue Establishments of State Railways are open to Natives of India, and that the Government of India would be glad to employ those found in every respect suitable for the superior grades. With reference to this circular, Major Boughey says that he does not know of any such men, and has no means of obtaining them except by recommending the promotion of subordinates,—a practice he would resort to rarely and cautiously in the case of either Natives or Europeans. One great difficulty at present in the way of employing Natives in the higher supervision on Railways is the large amount of European labour and subordinate supervision still employed. When this in time is reduced the higher supervision by Natives may possibly follow. Most of the Europeans employed as Superintendents were taken over from the Company.

Mr. P. D. Barclay, *Traffic Superintendent, Eastern Bengal State Railway*—has no objection to employ anywhere Natives if qualified, but they are not qualified to have charge of larger stations when they are brought in contact with European subordinates or supervise men of their own race and caste. Bengalis are so much influenced by ties of caste and family that less dependence can be placed on them. Experience shows that Europeans do the work better in larger stations, where self-reliance, experience, sobriety, and freedom from influences of caste and family are required to enable the Station Master to exercise proper control over the staff under him.

Mr. S. Finney, C.E., *Assistant Manager, Eastern Bengal State Railway*—would employ Natives in the supervision department so far as it is possible to obtain fit men.

Mr. A. W. Rendell, *Locomotive Superintendent, Eastern Bengal State Railway.*—In order to become a thoroughly competent Engineer for the Locomotive Department, where extreme nicety of manipulation is required in dealing with engines, a man should undergo a training in Railway workshops. The witness has met numbers of Native Mechanics, but not a Native Mechanical Engineer. All the officers in his Department in charge of supervisional functions were born and trained in England. The men trained in this country as Mechanical Engineers are fairly efficient, but have not the accuracy and method of a man trained at home, and have not the opportunity for acquiring it as they do not see such good work. Natives turn out very good work under European supervision, but are not as accurate as a European. The furlough rules for the Uncovenanted Service tell very hardly on Europeans, especially those whose avocations expose them to the climate. They prevent men who desire to keep pace with the times in technical knowledge from doing so. A man can visit England only once in ten years, except on sick leave. The Guaranteed Railways allow one year's furlough after seven years' service, and thereafter at shorter intervals at the ratio of two months for every year of service.

INDIA.

Public Works Department.

Section II.—Information supplied by the Government of India in the Public Works Department.

Memorandum prepared in the Office of Secretary to the Government of India, Public Works Department, in reply to letter No. 149, dated 17th March 1887, from Secretary, Public Service Commission.

I.—Preliminary.

It is understood from the explanatory letter No. 212, dated 22nd March, that the information asked for in the above letter is to cover the superior and subordinate services, excluding only ministerial and menial establishments; that is to say, briefly, it is to include the whole of the technically trained or professional establishment, and for the purposes of clause (5) of letter No. 149, the information is to include all gazetted appointments outside the technical establishment. The latter are few and may be counted on the fingers.

2. To elucidate what follows, it will be well to explain at the outset that the whole of the technical establishment of the Public Works Department is divided into the following classes: the number of members in each class is shown against each :—

General classification of establishment.

I.—The Engineering branch of the Public Works and Military Works Departments—

	Government of India.	Madras.	Bombay.	Total.
(*a*) Engineers	834	87	94	1,015
(*b*) Upper Subordinates	686	188	224	1,098
(*c*) Lower Subordinates	...	...	...	...

II.—Accounts—

(*a*) Superior (Examiners of Accounts)	66	3	2	71
(*b*) Subordinate (Accountants)	395	57	52	504

III.—State Railway Revenue establishment—

(*a*) Superior	125
(*b*) Subordinate, classified	110
(*c*) Ditto, unclassified	...

Classes II (*a*) and III are wholly under the Government of India, although lent for the use of railways and other works and establishments under the other presidencies.

3. With the above explanation, the several heads on which information is asked for in the Secretary's letter No. 149, dated 17th March, will be taken up in their order.

II.—Regulations for Admission to the several Grades and Ranks of the Department.

4. There are different rules for admission to each of the above classes :—

Class I (a)—The Engineer Establishment.

5. The establishment classed as I (*a*), and generally known as the Engineer establishment of the Public Works Department, is now a close service, and admission to it is ordinarily possible only under the following conditions :—

The Engineers Establishments. First appointments.

(1) From amongst Royal Engineers on the Indian establishment.
(2) From passed students of the Royal Indian Engineering College, Cooper's Hill.
(3) From passed students of the Indian Civil Engineering Colleges.

The annual number of admissions at present is 30, which represents an ultimate strength of 800 men, and the recruitment is distributed amongst the three sources of supply as follows :—

Royal Engineer Subalterns	6
Royal Indian Engineering College, Cooper's Hill	15
Indian Colleges	9*
Total	30

* Thomason College, Rurki . . 4 and 5 alternately.
Seebpore, Howrah . . . 2—1 "
Madras Civil Engineering College 1
Poona College of Science . . 2

Royal Engineers of rank higher than Subalterns are also admitted into the higher ranks; but as Royal Engineers of similar rank are continually reverting to military duty, it may be said that such admissions merely serve to prevent the establishment from being depleted, such admissions compensating the reversions.

Royal Engineer Subalterns are generally appointed Assistant Engineers, 2nd grade. The Cooper's Hill students are generally appointed in the same grade, and the students from the Indian Colleges are appointed as Apprentices on ₹100 a month. The Apprentices may be promoted, if reported qualified, after six months, to 3rd grade. All officers appointed in or promoted to the 3rd grade must serve in that grade for a year before promotion, and must also pass an examination in practical work. All officers appointed in the 2nd grade must pass this same examination before promotion to 1st grade; and all officers before promotion to 1st grade must pass an examination in colloquial vernaculars (see Appendix B).

All officers before promotion to Executive Engineer, 4th grade, must pass in the vernacular by the lower standard, and in reading vernacular letters and accounts (see Appendix B).

Appointments other than as explained above can only be made with the sanction of the Secretary of State, and they may be said to have practically ceased. In fact, Government is so fully alive to the dangers of irregular recruiting that it is only under the most exceptional circumstances that such appointments would be recommended.

Promotions.

6. For purposes of promotion the whole of the Engineer establishment is distributed as follows:—

I.—The higher appointments of Chief and Superintending Engineers are on three separate lists named below, and the promotion of the members of each list rests with the Government named:—

	Numbers on each list. Chief Engineer.	Superintending Engineer.
Government of India	14	39
Madras	2	6
Bombay	2	4

It should be explained that the Government of India list includes the officers who serve on the staffs of all the Local Governments and Administrations except Madras and Bombay.

II.—The Executive and Assistant Engineers are on the following lists for promotion, the promotion of the members of each list resting with the Government or Administration named:—

(*a*) Madras.
(*b*) Bombay.
(*c*) Military Works (Government of India, Military Department).
(*d*) Railways (Government of India, Public Works Department).
(*e*) Bengal.
(*f*) North-Western Provinces and Oudh.
(*g*) Punjab.
(*h*) Local list, including Burma, Central Provinces, Assam, Central India, Rajputana, Hyderabad, Coorg (Government of India, Public Works Department).

In making promotions, the several Governments are assisted by half-yearly recommendation rolls submitted by the Executive and Superintending Engineers. In the case of promotions made by the Government of India under (*c*), (*d*), and (*h*), the rolls are submitted, respectively, through the Inspector-General of Military Works, the Director-General of Railways, the Local Government on whose Railways the officers are serving, and through the several Local Governments in the Public Works Department.

The promotions above the rank of Assistant Engineer, 2nd grade, are regulated by a scale sanctioned by the Secretary of State for the whole Engineer establishment, which is distributed to each list proportionately to the numbers borne on the list.

Scales for promotion.

This scale is theoretically so adjusted as to give promotion from Assistant Engineer, 2nd grade, to Executive Engineer, 1st grade, after certain moderate periods of service, and it would do so if the establishment were normal,—that is, if recruitment had been regular for a period of 30 years. In practice, however, the promotion given by the scale is not regular, owing to the recruitment having been regular for the last few years only, and the elaboration of a scheme that will give fair and regular promotion to an irregular establishment has been a problem before the Government of India for many years. A scheme was worked out four years ago, approved by the Government of India, and submitted to the Secretary of State, but rejected by him as too expensive. Some temporary relief was, however, afforded by the scheme actually sanctioned, which will serve for a time to stimulate promotion until the inevitable block again establishes itself.

Class I (b)—Upper Subordinate Establishment.

7. The upper subordinate establishment, as regards its source of recruitment, may be divided into three portions:—

(1) The local lists which are under the Government of India.
(2) The Madras list.
(3) The Bombay list.

Sources of recruitment.

The whole of the lists under the Government of India, aggregating 686 members, are primarily recruited from European soldiers and civilians, European and Native, who go through two years of theoretical training at the Thomason College, Rurki, and after passing their examinations successfully are then posted for one year of practical training as Apprentices on large works. After this they are drafted off to the several lists of the Local Governments and Administrations according to requirements. The annual number thus recruited has hitherto varied from 20 to 30, but has now been restricted to 26. If, however, in any year the supply as above from Rurki is deficient, vacancies on these lists may be filled in the following several ways by the several Local Governments:—

(*a*) By appointing passed students of the Seebpore College, Calcutta.

(*b*) By appointing soldiers or civilians direct without passing through a Government College, provided they can pass a test in arithmetic, mensuration, account-keeping, and elementary practical geometry; can prepare simple drawings; can lay down and construct a building from drawings and specifications; can prepare a simple estimate; and can survey with chain and compass. Europeans so appointed must have a fair knowledge of the vernacular, and Natives must be able to speak and write English fairly.

(*c*) By appointing men who have a thorough practical knowledge and experience in any useful branch of engineering without any theoretical test.

The men appointed under the third of the above conditions are generally lower subordinates who have distinguished themselves by useful practical work, and a fair number of such appointments are made.

Appointments as above are usually made in the grade of Overseer (salary R60 to R100), and promotions are made on each local list by each Local Government or Administration, the numbers on each list being regulated by a scale fixed by rate. There are eight grades in all, as will be seen by reference to the schedule of grades and rates of pay with the numbers in each appended.

Sub-Engineers.

A Sub-Engineer, 1st grade, after five years in the grade, may receive for meritorious service an increment of R50 and a second increment of R50 after a second similar period. Upper subordinates are never now promoted to the Engineer establishment, although there are in that establishment several who have been so promoted in former years. For the Engineer establishment, as at present constituted, such promotions are not considered desirable by the Government of India.

Before being promoted to the Sub-Engineer class, a man must either have passed the test known as the higher or College standard at Rurki, or must possess special and superior qualifications as a practical Engineer.

Appointments and promotions on the Madras and Bombay lists, numbering 188 and 224, respectively, are made on exactly similar principles, except that the Madras Civil Engineering College and the Poona College of Science take the place of the Thomason College in being the primary source of supply for these establishments.

Class I (c)—Lower Subordinate Establishment.

Lower subordinates: Appointments.

8. Appointments to this Establishment are made wholly by Local Governments, who may delegate their power to Superintending and Executive Engineers under rules locally approved regarding qualifications. The number of appointments and the distribution amongst the three grades is regulated by a money grant sanctioned by the Government of India in the case of establishments chargeable to Imperial funds and by the Local Government in the case of establishments chargeable to Provincial.

The Thomason College, Rurki, has a department for training lower subordinates, and gives them certificates of qualification after test examinations. The Principal maintains a register of qualified applicants, and Local Governments refer to him for men when they require them. It is believed that similar arrangements hold at Seebpore and the other Colleges.

The course laid down for the lower subordinate class at the Thomason College will be found at paragraph LXVIII of the College calendar for 1886.

Class II (a)—The Superior Accounts Establishment.

Superior Account Appointments.

9. This establishment is recruited, first, by appointments from the Engineer establishment in the grade of Assistant Examiner or higher; secondly, by the appointment, as Apprentice Examiners, of candidates who pass the educational test laid down in Appendix C, paragraph 1, of the Public Works Code; and thirdly by promotion from the subordinate class of Accountants who possess superior qualifications, and who pass the educational test prescribed as above for Apprentices, omitting the language test.

The Government of India reserves to itself the right of appointing qualified persons from other sources besides those enumerated above.

Assistant Engineers pass no accounts test on appointment to the Accounts Branch; but before confirmation or promotion they have to pass a special examination in accounts and departmental procedure, as laid down for the promotion of Assistant Engineers to the first grade in paragraph 26 of Appendix C, P. W. Code. They also have to pass the professional and language tests prescribed for Assistant Engineers (see paragraph 5). Candidates for the post of Apprentice are nominated, in the first instance, by the Accountant-General, Public Works Department; and after their names have been

approved and registered by that officer, they are examined either at the Thomason College, or, in the presence of a departmental officer, from papers obtained from the College. The examination is conducted by the Principal of the College in November of each year. The fact of passing the examination gives no claim to an appointment, and those who pass are appointed only as vacancies occur. After being thus appointed, an Apprentice is required to serve on probation for not less than six months and until reported efficient. If he fail to become efficient in two years, he is not retained. Before promotion to 1st grade of Assistant Examiner he must pass the Examination in book-keeping and departmental accounts prescribed in Appendix C, P. W. Code, paragraph 26; andi f he fails to pass this test within three years of appointment, including his apprenticeship, he will be removed. Accountants who are candidates for appointment to the superior establishment pass the educational test under the same rules and procedure as candidates, but men of mature age are sometimes exempted from this examination. If, when appointed, they have not passed the general and technical (accounts) examination laid down for promotion to Accountant, 2nd grade (Appendix C, paragraphs 30-499), they must pass the similar technical examination laid down for promotion to Assistant Examiner, 1st grade, within two years of appointment to the superior Accounts, or within three years of appointment as Accountant, whichever gives most time. Those who fail to pass must revert to the Accountants' establishment. Accountants promoted to the superior Account Establishment on account of long meritorious service in the subordinate grade are warned that they must not expect promotion above class IV, grade 3, of Examiner.

Promotions.

10. The promotions of officers of the superior Accounts establishment are made on the same principles as those of the Engineer establishment on a scale fixed by rule. There is one list for the whole establishment, and the promotions are made by the Government of India on recommendation rolls submitted by Local Governments regarding the officers serving under them.

Class II (b)—Subordinate Accounts Establishment.

Subordinate Accounts Appointments.

11. Appointments are made to the subordinate Accounts establishment on the lists under the Government of India, which comprise all the establishments except those of Madras and Bombay as follows:—

First.—From outsiders who are under the age of 25 years, and who pass a test examination in writing, dictation, arithmetic, mensuration, and mercantile book-keeping. The examinations are held twice a year—in November by the Thomason College, and in June by the Howrah Civil Engineering College—either at the Colleges or at the office of an Examiner, Public Works Accounts. The Colleges act simply as examining bodies, the candidates for examination applying to the head of the Accounts Office of the province or Railway in which they desire to serve, and the latter arranging the examination on one of the dates mentioned above.

Secondly.—From men already in Government service after passing the above examination without the limit of age.

Thirdly.—From upper subordinates of the Executive branch, the examination being dispensed with in the case of those who have proved their aptitude for accounts work.

Fourthly.—From candidates who have passed the Entrance examination to the Engineer class of the Thomason College, and who are exempted from the preliminary examination.

Persons qualified as above may be appointed to vacancies under Local Administrations, including Military Works Department and Railways, by the Accountant-General, Public Works Department; and by Local Governments to vacancies in the establishments under them. Appointment to a higher grade than 4th by any of these authorities requires confirmation by the Government of India. For the purpose of making these appointments, lists of passed candidates are maintained by each Examiner. After first appointment every Accountant will be on probation for a year, and will only be confirmed on condition of being reported qualified and after having passed an examination, conducted by the Examiner under whom he is serving, in the divisional accounts of one section of the Department, such as General, including Buildings and Roads and Irrigation Accounts; State Railway construction; or State Railway revenue.

Promotions: Government of India list.

12. For purposes of promotion the establishment of the subordinate Accounts under the Government of India is distributed into the following lists:—

I.—Bengal.
II.—North-West Province.
III.—Punjab.
IV.—Local Administrations, Military Works Department, Office of the Accountant-General, Public Works Department.
V.—Railway Branch, including all the establishments employed on State Railways; under Examiners, Guaranteed Railway Accounts; and joint Auditors of Accounts of Railway Companies.

Promotion on lists I, II, and III are made by the heads of the respective Local Governments on recommendation rolls sent up by the respective Examiners; and on lists IV and V by the Accountant-General, Public Works Department, on rolls sent up by the respective Examiners, after taking the orders of the head of the Department or Administration concerned. A scale is fixed for each list according to rule.

No Accountant, 3rd grade, may be promoted to the 2nd grade until he has passed an examination in two parts, one comprising a general educational test, and the other in composition, book-keeping, and departmental accounts. Full details of these examinations are given at paragraphs 30-49, Appendix C, Public Works Code, which may be consulted. The general educational test is dispensed with in the case of persons who pass the University Entrance test of an Indian University, and the whole examination may be dispensed with in the case of persons not already belonging to the Accounts Branch who possess special qualifications as Accountants, but in such cases the appointment can only be made by the Government of India.

Madras and Bombay lists.

13. There is a separate establishment of Accountants in each of the presidencies of Madras and Bombay, the appointments and promotions in which are made by the Local Governments. In the case of Madras these are made under the rules and on the conditions stated above, except that in that presidency there is a 5th grade of Accountants on ₹40—5—75. In Bombay the grades and rates of pay are the same, but the tests for appointment and promotion laid down by the Government of India are not applicable there, the Local Government not having accepted them.

Travelling Inspectors, Railway Accounts.

14. Travelling Inspectors of Railway Accounts are appointed on the same rates of pay as Accountants, and in the same grades, but are not required to pass any examination. They are appointed by the Accountant-General on the recommendation of the Examiner of the Railway and with the approval of the Manager. Examiners of Railways are required to be careful to recommend none but suitable candidates, and every Travelling Inspector is on probation for one year. The Examiner then submits a report on him, through the Manager, to the Accountant-General, and if the report be unfavourable, his services are dispensed with.

Travelling Inspectors are promoted from grade to grade by the Accountant-General on the recommendation of the Examiner made with the approval of the Manager. There is no general scale of Travelling Inspectors, and their appointments and promotions are regulated by the requirements of each Railway. They are not eligible for transfer to the establishments of Accounts unless they happened to be passed Accountants.

Class III—State Railway Revenue Establishment.

State Railway Revenue Establishment.

15. The State Railway revenue establishment is engaged wholly on open lines of State Railways. The superior and a portion of the subordinate establishment is included, like the rest of the establishments above enumerated except the lower subordinate, in the classified list of the Department, but there is a large staff of subordinate employés, numbered by hundreds, which finds no place in the classified list. This consists of engine-drivers, mechanics, guards, station-masters, and others. They cannot be classified by grades, and those appointed since September 1881 are non-pensionable. Such of them as have not covenants are liable to dismissal at any time with short notice; their appointments are sanctioned on half-yearly authorization rolls which are submitted by each Railway Administration to the Government of India or the Local Government.

Class III (a)—Superior Revenue Establishment.

16. The superior establishment comprises the following departments of Railway work:—

The Manager's Department.
The Traffic.
The Locomotive.
The Storekeepers.
The Paymasters.

Appointments to the higher grades of the Manager's Department are generally made from amongst selected members of the Engineer establishment, who have been engaged on Railway work. At the commencement of open-line operations, experts in traffic management and locomotive work were introduced in considerable numbers from the guaranteed companies and other sources, and this practice still continues to a certain extent, specially when any of the guaranteed companies, as recently the Sind, Punjab and Delhi Railway, are absorbed into the State system. Many of the men in the Locomotive Department were brought out originally under covenant with the Secretary of State, and this practice still continues inasmuch as qualified mechanical Engineers are rarely to be found in search of employ in the country. The ordinary sources of supply for this establishment at the present time may, however, be classified as follows:—

Sources of supply.

(1) Selection from officers of the Engineer and superior Accounts Establishment chiefly for the higher grades of the Manager's class.

(2) Appointment by the Secretary of State, generally under short covenants, of qualified professional men (this is almost entirely confined to the Locomotive Department).

(3) Nomination by the Government of India of candidates or apprentices in India, who after a period of promotion and passing certain tests, are eventually appointed to the lower grades. These appointments are generally in the Traffic Department, but a few have been made in the Locomotive Department.

(4) Appointment from the two upper classes, G and H, of the subordinate establishment.

Traffic Department.

Persons appointed in the candidate class of the Traffic Department have to serve on probation for a period which may extend to two years of approved service after attaining the age of 20 years. Before promotion to class IV, they have to pass a professional examination in departmental work, including a knowledge of the Revenue Code and Traffic Manual and in the vernacular by the lower standard.

Locomotive Department.

Appointments to the Locomotive Department, as already stated, are generally made from men trained in locomotive workshops in Europe, who are sent out under three years covenants with the Secretary of State and can extend their service after expiry of covenants.

Candidates who have served five years in some locomotive workshop, either in India or England, are also occasionally appointed in India on probation in class IV. Government reserves the right of appointing qualified officers in any class.

There are no special rules laid down for the appointment of Storekeepers and Paymasters who are included in the establishment. Qualified persons from any other service or from outside are appointed.

Class III (b)—Subordinate Revenue Establishment.

Subordinate Revenue establishment. Classes and appointments.

17. The subordinate classified State Railway Establishment comprises the following departments of Railway work :—

Inspectors of Maintenance.	Sub-Storekeepers.
Station Masters.	Assistant Foreman.
Carriage Inspectors.	Chief Clerks of Locomotive and Traffic.
Traffic Inspectors.	Paymasters.

Appointments to the sanctioned posts of the several classes allotted to each Railway are made by the Managers of the Railway, who are responsible that the men are competent.

Promotions.

18. Promotions in the superior establishment are made by the Government of India on the same principles as those of the other superior establishments. Promotions in the subordinate establishment are made by Managers of each Railway within the limits of the sanctioned scale.

The promotion of men in each class is regulated by the Government of India in accordance with the requirements of the several Railways, subject to a mileage limit of cost.

19. The subordinate establishment unclassified consists of the lower-paid and inferior classes of Railway establishment. Their appointment and promotion are under the same rules as those of the classified establishment.

Section III.—Conditions as to Pay, Pension, and Furlough.

Pay.

20. The pay of the various grades of the Engineer and Accounts establishment and of the classified portion of the state Railway Revenue establishment is clearly shown in Appendix A. to this memorandum. An examination of this schedule will show that Royal Engineers of the Engineer, superior Accounts, and superior Revenue establishment, who have elected the consolidated rates of pay, receive considerable sums as "*net*" *military pay* in addition to the salaries drawn by Civil Engineers of the same departmental standing. Those who have elected for the staff scale with military pay and allowances may draw less than the Civil Engineers of the same standing, if their rise in the Department has been rapid; but they draw considerably more if their departmental rank is low compared with their military rank: *e.g.*, a Lieutenant-Colonel, R.E., who is an Executive Engineer, 1st grade, draws R1,493-8-0 against R950 drawn by the Civil Engineer, and more than the pay of a Civil Engineer who is a Superintending Engineer, 2nd class, or two grades above him. It will be gathered, from what has been stated (paragraph 6), that advancement in pay depends on the recommendations by superior officers within the limit of what is allowed by the sanctioned scale of each branch; and that it is quite possible, especially in the Engineer establishment, for promotion to be greatly blocked by the conditions of the scale, irrespective of the merits of the establishment.

Pension.

Classes of Pension.

21. In regard to pension, the rules which relate to different classes of the establishment vary considerably, and the several establishments may be distributed into the following classes, according to the rules which relate to them :—

I—Royal Engineers of the original Indian Cadres.

II—Royal Engineers of the Imperial list who have not elected for continuous Indian service.

III—Other Military.

IV—Royal Engineers of the Imperial list who have elected for continuous Indian service.

V—Civil Engineers who came to India under covenants with the Secretary of State; Cooper's Hill Engineers; and all Civil Engineers professionally trained in England.

VI—Civil Engineers trained and appointed in India—

(*a*) From the Indian Colleges.

(*b*) Other sources.

VII—All other pensionable Civil officers.

VIII—Military subordinates (Warrant Officers and Sergeants).

IX—Non-pensionable officers.

22. It is unnecessary, perhaps, to enter into any detail regarding the first three classes—

Class I, which enjoys certain rules of its own, is fast disappearing.

Class II consists of men who will eventually revert to the English establishment and need not be considered.

Class III, comprising a very small number, enjoys the rules of its own service and is fast disappearing.

Officers of class IV receive *first of all* the gratuities or pensions that they would earn as military men whether in England or in India, *viz.*,—

	£
After 12 years' service, gratuity of	1,200
„ 15 „ „ „	1,600
„ 18 „ „ „	2,000
„ 20 „ „ pension of	200
„ 23 „ „ „	250
„ 27 „ „ „	300
„ 30 „ „ „	365

To these pensions they may add the proportionate difference between them and the Staff Corps pensions that their Indian service may entitle them to. These Staff Corps pensions are as follows:—

	£
After service of 20 years, pension of	250
„ „ 24 „ „	365
„ „ 28 „ „	500
„ „ 32 „ „	700

Thus an officer having 25 years' total service, of which 18 years are Indian, would draw—

	£	*s.*	*d.*
English pension	250	0	0
Proportion $\frac{18}{25} \times \frac{365-250}{1} =$	82	8	0
or	332	16	0

but as in future it may be taken that the great bulk of continuous-service men will have entirely Indian service, their pensions will virtually be the same as the Staff Corps pensions noted above.

It should be noted that all these four military classes receive pensions fixed in sterling, while Classes V and VI, which comprise civilians, receive them in rupees convertible into sterling, at the Government rate of exchange of the year.

23. Class V, under recent orders of the Secretary of State sanctioning certain more favorable pension rules for this class, enjoys the following rates of pension after the periods of service noted:—

Civil Engineers trained in Europe.

No. of years' service.	Sixtieth parts of average emoluments.	Subject to a maximum of	
	R	R	
10	20	1,000	On medical certificate.
11	21	1,400	
12	22	1,800	
13	23	2,200	
14	24	2,600	
15	25	3,000	
16	26		
17	27		
18	28		
19	29		
20 to 24	30	4,000	Without medical certificate.
25 and upwards		5,000	

The following special additional pensions are also authorized as rewards of approved service for those officers who serve as Chief and Superintending Engineers:—

	Extra pension over and above that allowable under the above scale.	
	R	
To those who have served three years as Chief Engineers or who may have been graded as such	2,000	per annum.
To those who may have served three years as Superintending Engineers	1,000	

India.
P. W. Department.
Section II.

This class also counts the following periods of furlough as service counting for pension in certain periods of total service :—

If the whole service of the officer is not less than	He counts as pensionable service furlough for
20 years	2 years.
25 „	3 „
30 „	4 „
35 „	5 „

Those Engineers who, after previous practical experience, entered the Department at a comparatively advanced age are allowed to add a period not exceeding three years to their pensionable service.

For periods of service under 10 years this class receives gratuities on the same scale as Class VI on obtaining medical certificate of unfitness for further service.

Civil Engineers trained in India.

24. The pension rules of Class VI are those of the main body of the Uncovenanted service and are as follows :—

After less than 15 years' service on medical certificate of unfitness of further service, one month's emoluments for each year's active service, up to a maximum of 12 months in all.

After 15 years' active service, one-third of the average of the emoluments of the last five years, up to a maximum of ₹3,000 a year, if the average emoluments are above ₹12,000 a year, and of ₹2,000 if below the same amount.

After 25 years' active service, half the average emoluments of the last five years, up to a maximum of ₹5,000 per annum, if the average is more than ₹12,000 per annum, and of ₹4,000 if the average is below the same amount. In calculating the several periods of under 15, 15, and 25 years, no period passed on any leave, except privilege leave, counts for pension. No officer can claim pension, except on medical certificate, unless—

(1) he has completed 30 years' service, or (2) he has reached the age of 55; and if he entered the Department after the age of 25 and after January 25th, 1871, the pension admissible, as calculated above, on superannuation is multiplied by a fraction of which the numerator is the number of years' service completed, not exceeding 30 and the denominator 30.

Class VI (*a*) counts service before age of 22 as pensionable; Class VI (*b*) do not count such service. The reason of this is that Class VI (*a*) generally enter the Department after technical training at the age of about 22, while Class VI (*b*) entered young and got their technical training in the Department; they are therefore not allowed to count this apprentice service as pensionable. Those of Class VI who rise to the rank of Superintending Engineer, obtain the pensions of Class V.

Members of the establishment who are not Engineers.

25. Class VII of the pensionable classes embraces all the pensionable civil members of the establishment who are not Civil Engineers,—that is, it embraces the following classes of paragraph 2 :—

All the members of the superior Accounts establishment [Class II (*a*)] who are not Royal or Civil Engineers.

The whole of the subordinate Accounts establishment [Class II (*b*)] who are pensionable.

The whole of the superior State Railway Revenue establishment [Class III (*a*)] who are not Royal or Civil Engineers and who are pensionable.

All gazetted officers outside the regular establishment.

The whole of the upper subordinate branch of the Engineer establishment who are not military men [Class I (*b*)].

The whole of the lower subordinate establishment [Class I (*c*)].

The whole of the subordinate Revenue establishment who are pensionable [Class III (*b*)].

The rules which appertain to all this class are the same as those of Class VI, except that no service before the age of 22 counts, and that, whatever the rank or pay of the officer, he cannot obtain the better pension rules of the Civil Engineers.

Civil Engineer Provident Fund.

26. In addition to their prospective right to pension, all Civil Engineers who have entered the Engineer establishment at any time, through whatever channel, in whatever branch of the Department they may now be serving, and all Civil members of the superior Accounts establishment, enjoy the benefits of a provident fund to which those in the Department at the time of the issue of the order in 1884 may subscribe at their option. The amount subscribed monthly must be not less than 5 and not more than 10 per cent. of their salary, Government paying 4 per cent. interest on their deposits, and the interest added to the principal annually. Those who enter the Department after 1884 are compelled to subscribe, subject to the above limits of minimum and maximum. The fund thus accumulated is the absolute property of the officer or his heirs and executors.

27. Class VIII, Military upper subordinates (Warrant Officers and Sergeants) have a special scale of Military pensions on the following scale :—

	England or the Colonies per annum.	India per mensem.
	£	R
Deputy Commissioners	216	200
Assistant Engineers	144	140
Deputy Assistant	108	100
Conductors	90	85
Sub-Conductors	72	70

Non-pensionable Officers.

28. Class IX, non-pensionable officers, belong almost wholly to Class III of paragraph 2 (State Railway Revenue establishment), but some Railway Accountants and Travelling Inspectors, who belong to Class II (*b*), are also included. An officer transferred to the State Railway establishment from one of the pensionable establishments carries with him his right to pension, except in certain cases of subordinate and ministerial officers who have joined the establishment since September 1881 and have entered under the condition of being non-pensionable. No officers appointed direct to the State Railway establishment since September 1881 are pensionable. All non-pensionable officers of the State Railway establishment employed on open lines come under Provident Fund rules, which are briefly as follows :—

Provident Fund rules.

From the salary of every servant not a pure Asiatic, being married or a widower with children, whose salary is not less than R15, a compulsory deduction of one anna in each rupee is made, and the same deduction is made from any servant whatever who, in writing, may desire it.

From the salary of every other servant whose pay is not less than R15, a compulsory deduction of half an anna in every rupee is made.

Deposits under either of the above conditions are termed compulsory deposits.

Every half-year the State credit each depositor's account with a bonus equal to one half the compulsory deposits made during the half-year and with a share proportionate to his compulsory deposits for the half-year of a bonus, the total amount of which is equal to 1½ per cent. of the net earnings of the line during the half-year; provided that the aggregate bonus granted to each person in any half-year shall not exceed his compulsory deposit during the same period.

Interest on these deposits is allowed under the savings banks rules 3½ per cent. and is added to the principal annually.

In addition to the compulsory deposits, voluntary deposits may be made in the Provident Fund subject to the Government savings banks rules. The limit of annual deposits under the State savings bank rules applies to voluntary deposits, but not to compulsory.

The bonus is only provisionally allowed and may be withheld, in whole or in part, in the case of a servant dismissed. And in the case of outstandings against a depositor who has been dismissed or absconded, the amount of outstanding may be withheld from his compulsory or voluntary deposits.

29. It may be noted here that all members of the Engineer, Civil and Military, superior Accounts and superior Revenue Establishment are compelled to retire on the pensions due to them on attaining the age of 55 years. Royal Engineers on attaining the rank of Major-General are compelled to vacate their appointments and can only be reappointed as Chief Engineer, 1st class,—that is, the highest rank in the Department. If then they have not attained that rank on the list they are retired, and several Royal Engineers have been lately compelled to retire under this rule some years before attaining the age of 55. In this respect they are at a disadvantage compared with Civil Engineers.

Furlough.

Classification of Establishment according to furlough rules.

30. As regards furlough, the officers of the Public Works Department may be divided into the following classes :—

I.—Military officers subject to Military rules.

II.— Ditto ditto Civil rules.

III.—Civilians subject to the Leave rules of Chapter V of the Civil Leave Code.

IV.—Civilians subject to the Leave rules of the Uncovenanted Service (Chapter X of the Civil Leave Code).

Military rules.

It is unnecessary, perhaps, to go into the question of the Military leave rules, which are numerous and complicated. The classes of the establishment which come under them are—

(*a*) Royal Engineers of the old establishments;

(*b*) Royal Engineers on the Imperial list who have not elected for continuous service in India;

(*c*) Staff Corps and other military officers.

Members of these classes will, in a few years, disappear from the establishment.

Civil leave rules.

The only class of the establishment which comes under Class II consists of Royal Engineers who have elected for continuous service. Class III comprises all persons, in whatever branch of the establishment, who have been appointed in England, and in whose covenants or letters of appointment it is not distinctly stated that they are liable to other rules: practically it may be said to embrace all officers of any superior branch appointed from England.

It also embraces certain officers appointed in India, as explained in the next clause.

India.
P. W. Department.
Section II.

Class IV embraces all officers of any class appointed in India, with the exception of European and East Indian officers not below the rank of Assistant Engineer in the Engineer establishment, and of corresponding rank in other branches, who were appointed in India up to the 3rd January 1872. These latter enjoy the same furlough rules as Class III.

Leave rules of Royal Engineers and certain Civil Engineers who enjoy the better rules.

31. The furlough rules enjoyed by Class II and Class III are those of Chapter V of the Civil Leave Code. Disregarding some minor points of difference which need not be gone into, the rules under this chapter are the same for each class with two important differences. The first of these relates to the minimum and maximum leave allowance to be drawn on ordinary furlough. These are—

A.—For a Royal Engineer Officer—Maximum, £250 a quarter in England, or R833⅓ a month in India. *Minimum*, £125 a quarter, or his last salary, whichever is least, in England: or R416⅔ a month, or last salary, whichever is least, in India.

B.—For a Civil Engineer or officer of corresponding rank—Maximum, £200 a quarter in England, or R666⅔ a month in India. *Minimum*, half the average of his salary for his last three years of active service, whatever it may be, subject to no minimum.

32. The result of the above difference as regards minimum may be illustrated as follows:—

Taking the exchange at 1*s.* 6*d.*, a Royal Engineer Officer will draw his full pay while on leave so long as it is less than £41-13-4 (=R560) a month. Thus a Civil Engineer cannot draw as much furlough pay as a Royal Engineer of the lowest rank (*viz.*, Assistant Engineer, 2nd grade) until he has been an Executive Engineer, 3rd grade (or three grades above the Royal Engineer) for three years; and a Royal Engineer of the rank of Executive Engineer, 4th grade, will draw £41-13-4 while on leave, against £41-5 drawn by a Civil Engineer of the rank of Superintending Engineer, 3rd class, or four grades above him, and proportionately more than Civil Engineers below that class, but of higher or equal rank with himself.

And as regards maximum, the Royal Engineer may draw £1,000 a year against the Civil Engineer's £800.

The second difference relates to the maximum of furlough, including special leave with allowances. The maximum furlough and special leave with allowances that can be taken by a Civil Engineer is six years, while the Royal Engineer can take a maximum of six years' furlough and his special leave in addition.

Special leave can be taken for six months at any time with six years' intervals and the first period carries furlough allowances; so that, taking the ordinary service at 30 years, the Royal Engineer can get some two years' more leave than the Civil Engineer; six months, however, only of which carry furlough allowances.

Superior leave rules generally explained.

33. In other respects, the furlough rules of the two classes are the same, and generally they are as follows:—

The amount of furlough earned is one-fourth of the active service—thus eight years' service would give two years' furlough.

Furlough up to two years may be granted to an officer who has rendered three years' continuous service—

(*a*) On medical certificate unconditionally.

(*b*) Without medical certificate, provided that it is due* and that the officer has rendered eight years' active service; and it may be extended on medical certificate up to three years.

* *i.e.*, that it is at his credit.

A.—The first two years of this furlough carries allowances at half average salary, subject to the maxima and minima rates already stated.

B.—For any extension beyond two years a military officer is entitled to a subsistence allowance, ranging from R250 to R400 a month, according to length of actual residence in India; and a civilian is entitled either to £120 a quarter at home or R400 a month in India, or to one-fourth of his average salary, whichever is less.

An officer who has not rendered three years' continuous service may be granted furlough to the extent of one year only on medical certificate.

The allowances during this furlough are the same as at *B* above; but if the officer has rendered six months' continuous active service, he may draw allowances as at *A* for any portion of the furlough that may be due under the one-fourth rule.

Inferior leave rules.

34. The leave rules for Class IV are simple enough and may be briefly explained as follows:—

(1) Six months' leave at each interval of six years' service, or

(2) One year after ten years and another yearafter eight years more, or two years after 18, subject to a maximum of two years in all.

The allowances are half average salary during the whole period, subject to a maximum of R500 in India and £150 a quarter in England: there is no minimum.

(3) Leave on medical certificate for three years in all, but not for more than two years at one time nor more than twice out of India. Leave on medical certificate counts as service for furlough.

Medical leave carries allowances of half average salary, subject to the maximum rates stated above, for the first 15 months of each period, but not for more than 30 months in all. Beyond those periods within the above limits of duration it carries one-quarter average salary, subject to a maximum of R400 in India and £120 a quarter at home.

Section IV.—The Technical Requirements of the Department.

35. The technical requirements of the Engineering branch of the Department will be best gathered from a perusal of the course of study laid down in the calendars of the Royal Indian Engineering College and of the Thomason College which accompany.

The course of study there prescribed is that considered in England necessary for the training of a Civil Engineer, and is in India considered essential for Engineers who may be called upon to undertake works of construction in the Railway, Irrigation, and Buildings and Roads Branches. It is also considered necessary for those engaged in maintenance in the two former branches, as in those branches large works of renewal are often required, and even for the mere maintenance of such important and costly works high professional knowledge and skill is required. In the Buildings and Roads Branch, where the works have already been constructed, highly-trained Engineers are not requisite, and for some years past it has been the policy of Government to hand over the buildings and roads of the country to the local boards for maintenance, with the aid of Engineers appointed by themselves, who are not generally superior to the best of the upper subordinate class. For any large works of renewal, such as the reconstruction of bridges, the professional assistance of the State Engineers is always available on payment by the boards of a certain percentage on the cost of works, and it is in many cases believed to be given without charge.

36. The qualification considered necessary for the upper subordinate establishment will be gathered from a perusal of paragraph 7, and of the course laid down for that class in the Thomason College calendar, which accompanies.

37. For the superior officers of the Accounts branch a complete knowledge of commercial accounts and book-keeping, and of the departmental systems of the several branches, General and Railways, including open line and store accounts, is requisite; also a complete knowledge of arithmetic and elementary algebra, geometry, and mensuration. A knowledge of pure mathematics, extending to the higher branches of the subject, is useful but not essential; but it is now being considered whether the test should not be considerably raised, so as to obtain the entertainment of men of higher education. In the highest posts of the Department it may be said that an officer should be a competent professional Accountant in the technical sense, which includes a knowledge of banking and commercial business; he should also possess a fair knowledge of actuarial science, extending to a practical acquaintance with the various tables used by actuaries and the mathematical formulæ on which they depend, together with an acquaintance with the simpler problems dealt with. At the same time he must have a thoroughly practical acquaintance with the several systems of accounts of the Department and the numerous Codes of the Public Works and Financial Departments.

38. For the higher Accountants a good knowledge of arithmetic, elementary algebra, mathematics, and book-keeping is necessary, an acquaintence with the several departmental systems of accounts is desirable, and an intimate knowledge of at least one of the systems is indispensable. For the lower Accountants a fair knowledge of book-keeping and a practical knowledge of one of the departmental systems is sufficient.

39. For the Traffic Department a fair knowledge of accounts and a thorough knowledge of the Traffic accounts of the State Railway Revenue System is necessary; also a thorough practical acquaintance with traffic work. It is considered that any person with a fair general education and of business habits, and with the necessary personal qualifications for enforcing authority, would make, with proper training, a good Traffic officer.

40. For the Locomotive Department the training of a Mechanical Engineer, according to the English system, is essential, and for this reason the Locomotive Department consists almost entirely of men so trained. It is possible for youths of fair education and with a bent for mechanical engineering to obtain the necessary qualifications in the Government workshops, and the rules are framed to allow of admissions in this manner.

41. The qualifications for the subordinates of the State Railway Revenue Department depend, as in the case of the superior officers, on the branch of the Department to which they belong.

For the Engineering Department the qualifications are the same as for the upper subordinates of the Engineer establishment.

For the Traffic Department the same qualifications, in somewhat less degree, are necessary as are required for the superior officers.

For the Locomotive Department a man must be a practical mechanical artificer trained either in the Indian workshops or sent out from England.

Section V.—The existing Organization and Constitution of the Department.

42. The schedule of the various classes of establishment, in the form prescribed in letter No. 291S. from the President of the Sub-Committee, dated 4th April, has been prepared as Appendix C.

It embraces the several classes of establishment referred to in the foregoing memorandum, with the exception of the lower subordinate and the unclassified State Railway Revenue Establishment. The former has been omitted because the maximum pay of this class is less than R100.

The information in the office of the Director-General of Railways is found to be insufficient to allow of the inclusion of the latter. A schedule, Appendix D, is appended showing the aggregate number of each department of the unclassified establishment attached to each State Railway, and it will be seen that it would take some time to classify these large numbers in the manner desired.

India.

P. W. Department.

Section II.

Should the Sub-Committee, however, desire it, a reference will be made to the several Railway Administrations for the information.

In addition to the graded establishments, referred to in the memorandum, the ungraded posts of the Secretariat of the Government of India and of the several Local Governments have been included in the schedule. These are all gazetted appointments.

43. In regard to the distribution of the establishment according to nationality as required by the form, it should be explained that this office has not the information to enable it to distinguish Europeans domiciled in India from Eurasians, nor can the accuracy of the classification between Europeans domiciled and not domiciled in India be in all cases vouched for. To make an accurate classification in these respects personal inquiries would be necessary, which it is not considered desirable to make, unless the Sub-Committee particularly presses for it.

44. In his letter No. 189, dated 18th March, the Secretary to the Public Service Commission asked that an additional column might be added to the schedule showing the class of Engineers to which each Engineer included in the statement belongs.

As no provision, however, was made for this information in the revised form sent with the President's No. 291, dated 4th April, it is thought that it will perhaps suffice to give the distribution of the total numbers as follows:—

Royal Engineers	191
Other Military	22
Civil Engineers appointed from Europe	473
" " " in India	243
Natives appointed in India	86
	1,015

Appendix A.

Schedule of the classes and grades of the several Establishments of the Public Works Department, with the rates of pay of each.

Engineer Establishment.

	R
Chief Engineer, 1st class	2,500
Ditto 2nd „	2,000
Ditto 3rd „	1,800
Superintending Engineer, 1st class	1,600
Ditto, 2nd „	1,350
Ditto, 3rd „	1,100
Executive Engineer, 1st grade	950
Ditto, 2nd „	800
Ditto, 3rd „	700
Ditto, 4th „	600
Assistant Engineer, 1st grade	500
Ditto, 2nd „	350*
Ditto, 3rd „	250
Apprentices	100

Royal Engineer officers who have elected for consolidated rates in preference to staff with military allowances receive their military pay proper in addition to the above rates as follows:—

	R	a.	p.
Colonel	304	8	0
Lieutenant-Colonel	243	8	0
Major	182	10	0
Captain	140	0	0
Lieutenant after three years' service	70	0	0
Lieutenant	60	0	0

Those who draw the staff scale with military pay and allowances may draw more or may draw less on the whole than the above rates according to their military rank.

Upper and Lower Subordinate Establishments.

	Civil consolidated salary. R
Sub-Engineer, 1st grade	400†
Ditto, 2nd „	300
Ditto, 3rd „	250
Supervisor, 1st grade	200
Ditto, 2nd „	150
Overseer, 1st grade	100
Ditto, 2nd „	80
Ditto, 3rd „	60
Sub-Overseer, 1st grade 50 10‡	70
Ditto, 2nd „ 35 5	45
Ditto, 3rd „ 25 5	35

Military Upper Subordinates draw a staff scale in addition to military pay of rank; they cannot, however, draw less than these rates and may draw considerably more.

Accounts Establishment.

Superior.

	R
Accountant-General	2,500
Examiner, Class I	1,600
Ditto, II	1,350
Ditto, III	1,100
Ditto, IV, 1st grade	950
Ditto, 2nd „	800
Ditto, 3rd „	650§
Deputy Examiner, 1st grade	550§
Ditto, 2nd „	450§
Assistant Examiner, 1st grade	350‖
Ditto, 2nd „	250‖
Apprentice	100

Subordinate.

Accountant, 1st grade	350	20	450¶
Ditto, 2nd „	250	15	340
Ditto, 3rd „	160	10	240
Ditto, 4th „	80**	7	150

Ditto, 5th „ 40 to 75 in Madras only.

Royal Engineers receive their military pay proper in addition to the rates shown for the superior establishment as in the Engineer Establishment.

State Railway Revenue Establishments.

Superior.

				R
Class I	1st grade			1,600
	2nd „			1,350
	3rd „			1,100
„ II	750	50		1,000
„ III	450	40		650
„ IV	250	30		400

Candidate, Traffic Department . 70 to 150

Subordinate.

Class H	320	16	400
„ G	240	12	300
„ F	170	10	220
„ E	110	10	160

Royal Engineers receive their military pay proper in addition to the rates shown for the superior establishment.

* Assistant Engineer, 2nd grade, after three years' service in grade, receives R400 per mensem if recommended.
† Two quinquennial increments of R50 each may be granted to Sub-Engineers, 1st grade, for long and meritorious service in the highest grade.
‡ Quinquennial increase.
§ These rates increased by R50 in case of Engineers transferred to Accounts Branch.
‖ Ditto ditto ditto after three years' service in grade.
¶ Two quinquennial increments of R50 each may be granted to Accountant, 1st grade, for long and meritorious service in the grade.
** Accountants, 4th grade, who have not passed the prescribed examination and are on probation ordinarily receive R60 per mensem.
Military men employed as Accountants receive the civil consolidated salary of grade.

India.

P. W. Department.

Section II.

Appendix B.

Rules relating to the Examination of Assistant Engineers.

Extract, paragraphs 9 to 17, P. W. D. Code, Volume I, Chapter II.

9. Assistant Engineers of the 3rd grade, before they can be promoted to the 2nd grade, or if appointed in the 3rd grade from the Royal Indian Engineering College, before promotion to 1st grade, must pass the examination prescribed in the following paragraphs. Assistant Engineers appointed in the 2nd grade must pass the examination before promotion to the first grade. An Assistant Engineer desirous of undergoing this examination will apply to the Chief Engineer, and, in forwarding this application, the Executive and Superintending Engineers will attach a special report upon those points of qualification which cannot be tested by examination, especially in regard to his physical energy and efficiency in practical work, and capacity to manage those under his authority. These reports shall always be considered preliminary to the examination, and the candidate shall not be entitled to be examined until they have been received and found satisfactory by the Chief Engineer.—See also para. 13.

10. The examination will be such as to show that he is acquainted with the processes for preparing materials, and with the modes of construction in use in India; that he has a good knowledge of the resources of the districts in which he has been employed, as to materials, and of the best mode of applying them, and that he understands the management of work-people; also that he has made himself acquainted with the rules of, and is conversant with the forms of account in use in, the Department.

11. The examination will be conducted by a Committee convened by the Chief Engineer, and composed of one Superintending Engineer as President, and two officers of the Engineer Establishment as members. It should be for the most part oral, and no theoretical points such as would in ordinary practice be met by a resort to books of reference should be introduced. Report of the Committee's proceedings, together with the special report prescribed in para. 9, and with the Superintending Engineer's observations and recommendation, will be submitted to the Local Government, who will decide on the report whether the examinee has passed. Successful candidates of the 3rd grade will be promoted with effect from the date of their passing the examination, provided that they have then served one year in their grade. The passing of the examination should be notified in the Gazette.

12. The Government of India may, in special cases, dispense with the examination, or reduce the period of service on probation.

13. Before an Assistant Engineer of the 2nd grade can be promoted to the 1st grade he must pass a colloquial examination in Hindustani, or in the language of the district in which he may be employed. This examination will be conducted by a Committee of three officers of the Department, assembled under the orders of the Superintending Engineer. The Committee will prepare twelve questions, or short sentences, on matters relating to the duty of an Engineer in connection with his works, which the candidate will be required to translate *viva voce* at once on their being read to him in a sufficiently accurate manner to be intelligible to a Native. If the Committee consider that the translation has been sufficiently accurate, they will certify the fact; and further that the candidate has conversed intelligibly with a native workman in their presence. This certificate is to be forwarded, with a copy of the questions or sentences, to the Superintending Engineer, who, if satisfied, will countersign it. On this being submitted to, and approved by, the Local Government, the fact of the candidate having passed should be notified in the Gazette, and the mark † affixed to his name in the Classified List. The colloquial examination is not necessary when an officer has passed the Lower Standard.—See also para. 9.

14. No Assistant Engineer will be promoted either permanently, temporarily, or officiating to the rank of Executive Engineer, 4th grade, until he has passed the examination for the first or Lower Standard, in Hindustani, or a similar examination in the language of the district in which he may be employed. He must also be able to read native letters and accounts, and his ability to do so will be established by a report to that effect from the Superintending Engineer. This examination (the Lower Standard, together with ability to read letters and accounts) will be called the Departmental Standard, and the letters D. S. will be placed in the Classified List against the names of those who pass. The facts of officers having passed the examination should be notified in the Gazette. Natives of India are exempted from the Departmental Standard Examination, when employed in a district where their own vernacular is spoken or if their own vernacular is Hindustani.

15. In the case of officers appointed from the Thomason College, the final College Examination in Hindustani will be accepted instead of the Lower Standard, and such officers will not be entitled to the honorarium admissible under clause I of para. 20. They will, however, on passing by the Higher Standard within five years of joining the Department, be entitled to the bonus of R360 allowed under clause II of the same paragraph.

16. When the examination is in any other language than Hindustani, the head of the Local Government will make use of the most suitable Committee at his disposal, which, under such orders as may be furnished for their guidance, will set an examination equivalent to the Lower Standard in Hindustani.

17. Any member of the Department who may have passed the higher Standard Examination in Hindustani, or similar examination in the language of the district in which he is employed, will be exempt from the operation of the rule in para. 14.

Appendix C.

Existing Organization and Constitution of the Public Works Department, India.

1	2	3	4						
			Number of Appointments in each Class or Grade now held by						
			(1)	(2)	(3)	4 Natives.			
						(a)	(b)	(c)	(d)
Department.	Total number of gazetted appointments, and of appointments not being purely clerical of salaries of Rl00 and upwards.	Distribution of the gazetted appointments and of other appointments mentioned in col. 2 amongst classes and grades with rate of pay attached to each.	Europeans not domiciled in India.	Europeans domiciled in India.	Eurasians.	Hindus.	Mahomedans.	Others.	Total.
Secretariat, Government of India.	1	Secretary, Military pay and allowance of rank + 2,500* staff	1	...	...	...	...	...	...
	1	Deputy Secretary, Railway Branch, and Director-General of Railways 3,000	1	...	...	...	...	...	...
	1	Deputy Secretary and Inspector-General of Irrigation Works 2,500	1	...	...	...	...	...	...
	1	Under-Secretary 1,350	1	...	...	...	...	...	...
	1	Ditto . . . . . 1,100—1,350	1	...	...	...	...	...	...
	1	Ditto 950	1	...	...	...	...	...	...
Madras Secretariat.	...	.....	...	...	...	...	...	...	...
	...	.....	...	...	...	...	...	...	...
	...	.....	...	...	...	...	...	...	...
Bombay Secretariat.	1	Under-Secretary 600	...	1	...	...	...	...	...
Bengal Secretariat.	...	.....	...	...	...	...	...	...	...
	...	.....	...	...	...	...	...	...	...
	...	.....	...	...	...	...	...	...	...
North-Western Provinces Secretariat.	1	Assistant Secretary . . . . . 600—800	1	...	...	...	...	...	...
Punjab Secretariat.	1	Assistant Secretary . . . . . 500—700	...	...	...	1	...	...	1
Engineering.	7	Chief Engineer, Class I 2,500	7	...	...	...	...	...	...
	6	Ditto, „ II 2,000	6	...	...	...	...	...	...
	5	Ditto, „ III 1,800	5	...	...	...	...	...	...
	17	Superintending Engineer, Class I . . . 1,600	16	...	1	...	...	...	...
	16	Ditto ditto, „ II . . . 1,350	16	...	...	...	...	...	...
	16	Ditto ditto, „ III . . . 1,100	16	...	...	...	...	...	...
	130	Executive Engineer, 1st grade . . . 950	125	5	...	...	...	...	...
	131	Ditto ditto, 2nd „ 800	112	13	1	5	...	...	5
	148	Ditto ditto, 3rd „ 700	118	24	1	3	...	2	5
	65	Ditto ditto, 4th „ 600	51	9	...	5	...	..	5
	362	Assistant Engineer, 1st „ 500	269	43	...	46	2	2	50
	112	Ditto ditto, 2nd and lower grades . 100—350	69	22	...	21	..	...	21
Upper Subordinate.	51	M.—C.							
	52	Sub-Engineer, 1st grade . . . 250—400	23	18	...	9	1	.	10
	103	Ditto, 2nd „ . . . . 200—300	15	26	...	10	1	...	11
	128	Ditto, 3rd „ . . . . 150—250	30	33	...	38	2	...	40
	215	Supervisors, 1st „ . . . . 120—200	39	39	...	46	4	...	50
	549	Ditto, 2nd „ . . . . 100—150	46	57	...	100	11	1	112
		Overseers . . . . . 85-60—100	70	118	...	329	31	1	361
Lower Subordinate.	...	.....	...	...	Salary	less	than	100.	
Superior Accounts.	1	Accountant-General 2,500	1	...	...	...	...	...	...
	5	Examiner, Class I 1,600	5	...	...	...	...	...	...
	4	Ditto, „ II 1,350	4	...	...	...	...	...	...
	5	Ditto, „ III 1,100	4	1	...	...	...	...	...
	7	Ditto, „ IV, 1st grade 950	6	1	...	...	...	...	...
	10	Ditto, 2nd „ 800	9	1	...	...	...	...	...
	12	Ditto, 3rd „ 650	8	3	...	1	...	...	1
	13	Deputy Examiner, 1st „ 550	9	4	...	...	...	...	...
	11	Ditto, 2nd „ 450	6	5	...	...	...	...	...
	4	Assistant Examiner, 1st „ 350	2	2	...	...	...	...	...
	...	Ditto, 2nd „ 250	...	...	...	...	...	...	...
	...	Apprentices 100	...	...	...	...	...	...	...
Subordinate Accounts.	34	Accountant, 1st grade . . . . 350—20—450	1	27	...	5	...	1	6
	34	Ditto, 2nd „ . . . . 250—15—340	...	21	...	12	...	1	13
	123	Ditto, 3rd „ . . . . 160—10—240	...	54	...	59	4	6	69
	288	Ditto, 4th „ . . . . 80—7—150	...	77	...	194	9	8	211
	25	Ditto, 5th „ . . . . 40 to 75 (Madras only)	...	2	...	23	...	...	23
State Railways Superior Revenue.	1	Special 2,500	1	...	...	...	...	...	...
	3	Class I, grade 1 1,600	3	...	...	...	...	...	...
	7	Ditto, „ 2 1,350	7	...	...	...	...	...	...
	7	Ditto, „ 3 1,100	7	...	...	...	...	...	...
	31	Class II . . . . . 750—50—1,000	28	3	...	...	...	...	...
	34	Ditto III . . . . . 450—40—650	30	4	...	...	...	...	...
	39	Ditto IV . . . . . 250—30—400	15	18	...	5	...	1	6
	3	Candidates . . . . . 70—100	...	3	...	...	...	...	...
State Railways Subordinate Revenue.	38	Class H . . . . . 320—16—400	9	29	...	...	...	...	...
	72	Ditto G . . . . . 240—12—300	24	45	...	2	...	1	3

* About R3,500 in all.

India.
P. W. Department.
Section II.

Appendix D.

Strength of Staff on State Railways, excluding Menial and Ministerial Establishments, as provided in the Establishment Rolls for the first half of 1887.

Railway.	Engine-drivers, average pay R300.	Mechanics, average pay R150.	Guards, average pay R75.	Station-Masters, pay R35 to R400.	Assistant Station-Masters, average pay R35.	Telegraph Inspectors, pay R100.	Signallers, average pay R35.	Total.	Remarks.
North-Western	500	1,766	326	309	246	1	471	3,619	
Eastern Bengal	93	225	62	83	13	...	202	678	
Northern Bengal	45	132	32	53	17	...	73	352	
Tirhoot	33	102	28	46	31	...	61	301	
Nalhati	3	7	2	4	3	...	1	20	
Dacca	14	9	6	13	1	...	16	59	
Nagpur-Chhattisgarh	32	19	23	23	8	1	34	140	
Wardha Coal	6	53	5	5	...	...	5	74	
Burma	57	125	35	25	45	...	53	340	
Bilaspur-Etawah and Umaria Colliery	4	9	3	4	...	...	5	25	
Total	787	2,447	522	565	364	2	921	5,608	

Appendix E.

Extract from the Proceedings of the Government of India, Public Works Department, No 128-144 R.E., dated Simla, the 10th November 1879.

India.
P. W. Department.
Section II.

Read again—

Public Works Department Resolution No. 1450-60E.R. of the 27th November 1878.

Read also—

Letter No. 469, dated 24th January 1879, from the Chief Commissioner, Central Provinces.
" " 149 E.R., dated 13th February 1879, from the Government of Bengal, Public Works Department, Railway Branch.
" " 208 R., dated 20th February 1879, from the Government of Madras, Public Works Department, Railway Branch, and enclosures.
" " 447, dated 27th February 1879, from Consulting Engineer to the Government of India for Guaranteed Railways, Lucknow, and enclosures.
" " 78 R.E., dated 3rd March 1879, from the Resident, Hyderabad.
" " 694, dated 10th March 1879, from the Consulting Engineer to the Government of India for Guaranteed Railways, Calcutta, and enclosures.
" " 1224-12 E.R., dated 19th March 1879, from the Chief Commissioner, British Burma.
" " 1924 E., dated 28th March 1879, from Director of State Railways, Western System, and enclosures.
" " 1736 E., dated 8th April 1879, from Director of State Railways, Central System, and enclosures.
" " 1075, dated 7th May 1879, from the Government of Bombay, and enclosures.
" " 1941 G., dated 23rd May 1879, from Consulting Engineer to the Government of India for Guaranteed Railways, Lahore, and enclosures.
" " 2260 G., dated 6th June 1879, from Consulting Engineer to the Government of India for Guaranteed Railways, Lahore, and enclosures.

OBSERVATIONS.—In Public Works Department No. 1450-60 of the 27th November 1878, the opinions of the Railway authorities on the practicability of employing Natives of India in the superior grades of the Traffic Department were solicited.

From the replies received, it appears that up to the present time few, if any, Natives of sufficient education have gone through an adequate course of training to qualify them for the post of Assistant Traffic Superintendent. It is also the general opinion that in the promotion of Native employés to the higher grades very careful selection and discrimination will be necessary.

RESOLUTION.—These observations should be communicated to all State Railway Administrations, with the view of keeping in sight the importance of a larger infusion of Natives into the higher ranks of the Traffic department. This can only be done by inducing young men of fair education and of a class corresponding to that of the Europeans employed in the department in question, to train themselves in the required duties by serving in the lower grades. It need hardly be observed that active habits and good constitution are as essential for the efficient performance of the duties of a Traffic officer in the higher grades as a knowledge of English and Accounts. Native Traffic officers should also be of a social status sufficient to command the respect of their subordinates.

It should be clearly understood that all posts in the Revenue establishment of State Railways are open to Natives of India, and as men in every respect qualified for the superior grades are found, the Government of India will be glad to receive from local Administrations recommendations for their employment in suitable positions.

ORDER.—Ordered, that this Resolution be communicated to the Governments, Administrations, and officers marginally noted, for information and guidance; also to the Foreign Department for communication to the Chief Commissioner, Mysore and Coorg.

The Governments of Madras, Bombay, Bengal, North-Western Provinces and Oudh, and Punjab.
The Chief Commissioners, Central Provinces, British Burma, and Assam.
The Resident at Hyderabad.
The Agents to the Governor-General for Central India, Rajputana, and Biluchistan.
The Director-General of Railways.
The Consulting Engineers to the Government of India for Guaranteed Railways.

J. S. TREVOR, *Major-Genl., R.E.*,
Officiating Deputy Secretary.

India.
P. W. Department.
Section II.

Information supplied by the Local Government of N.-W. P. and Oudh.

No. $\frac{2272}{\text{II. } 592\ 201}$, dated Nainital, 16th May 1887.

From—The Chief Secretary to Government, N.-W. Provinces and Oudh,

To—The President, Public Service Sub-Committee.

I am directed to forward, for the information of the Sub-Committee of the Public Service Commission, the papers noted on the margin, giving full and detailed particulars with regard to the question of the admission of Natives of India and of Europeans into the Public Works Department in these Provinces.

(1) No. 1687 E B R, dated 26th April 1887, from the Chief Engineer, N.-W. P. & Oudh.
(2) Appendix A. Existing organization and constitution of the P. W. D.
(3) Three nominal rolls.

2. I am to say that the Memo., No. 1687 E. B. R., dated 26th April 1887, represents the views of the Chief Engineer of these Provinces, an officer of great experience in the Public Works Department, whose views are entitled to much consideration. The Lieutenant-Governor and Chief Commissioner nevertheless desires to record his opinion that Colonel Lang's estimate of the capacity of Natives for rendering efficient service in the higher branches of the Departm entis too unfavorable, and proceeds too much upon experience of the past, without taking into sufficient account the probable results of higher and more extended education, and of the greater encouragement that should be and will be given to Natives of ability and fair social position to compete for the Rurki appointments. Sir Alfred Lyall has himself no doubt that the Rurki College might be expanded into a most valuable training school for Native Engineers in Upper India; and he would allow all Native Engineers once admitted into the Public Works Department every opportunity of showing themselves qualified, as they rise by seniority, for the duties of the grade of Executive Engineers.

No. 1687 E.B.R., dated Allahabad, 26th April 1887.

From—Colonel A. M. Lang, R.E, Chief Engineer, N.-W. P. and Oudh,

To—The Chief Secretary to Government, N.-W. P. and Oudh.

With reference to your letters to my address, No. 1242, dated 16th March 1887,
„ 1400, „ 23rd „ „
„ 1690, „ 6th April „
„ 1773, „ 9th „ „
relative to information regarding the admission of Natives of India and of Europeans to the Public Works Department of the Public Service in this country, I have the honour to state that I served as a local member of the Sub-Committee of the Public Service Commission while it was engaged at Allahabad, giving them all requisite assistance, my own personal evidence, and arranging for the oral evidence of certain selected Public Works officers (approved by His Honour the Lieutenant-Governor) who attended meetings of the Sub-Committee.

2. With reference to the "full and detailed particulars under each" of heads (1) to (5) specified in the letter No. 179 of 17th March 1887, from the Secretary to the Sub-Committee, which formed an annexure of your No. 1400 of the 23rd March 1887, and is now returned herewith, I have the honour to explain that the Sub-Committee no longer requires to be furnished by this Government with particulars under heads

(1)
(2)
(3) as far as regards matters of fact,
(5)

as full information on these points will be given to the Sub-Committee by the Government of India, as stated in India Public Works Department letter No. 622 G., dated 21st March 1887, there being all matters of regulation recorded in the Public Works Department Code and in the Pay and Pension Codes.

Information under head (3), as far as this is matter of opinion, and under head (4) is being collected by the Sub-Committee on evidence given by officers in different Provinces.

3. Leaving aside, therefore, all precise particulars respecting the present regulations of the Public Works Department as to admission and first appointments, promotion, conditions of service in regard to pay, pension and furlough, technical acquirements in several branches and grades, and the existing organization and constitution of the Public Works Department generally, the particulars in which information was sought by the Sub-Committee in the North-Western Provinces may be considered as confined to the following matters:—

I.—The existing organization of the Public Works Department in the North-Western Provinces.

II.—The classes of the community seeking admission or employed in the Public Works in the North-Western Provinces.

III.—The comparative capacities of these classes.

IV.—The professional and other requirements of the different branches.

And in considering these matters this must be done from the point of view of the Public Service Commission,—*i.e.*, the sources of supply for employés in the several and diverse branches of the public services and the qualifications of the individuals got from these sources.

These several points will be briefly noted on in turn.

(i) Existing Organization.

4. To illustrate this, a tabular Statement A has been prepared in the form prescribed by the Committee; it shows the number of Europeans, Eurasians, Hindus, &c., holding gazetted appointments or drawing salaries of ₹100 or over, and the rates of pay received by them. The members of the staff of the Irrigation and Buildings and Roads Branches are distinguished, the former being entered in red ink.

This statement is supplemented by three printed nominal rolls of the Engineers and upper subordinates serving in the North-Western Provinces on 1st January 1887.

These four statements give all particulars under this head, and need no comment beyond that given in the following paras. dealing with the classes comprised in the lists, and their comparative qualifications.

(ii) Classes of the community seeking admission or employed on Public Works.

5. It will be seen by consulting the Statement A and the nominal rolls that of 254 men drawing salaries of ₹100 and over —

111 are Europeans from England.
36 are do. domiciled in India.
16 are Eurasians.
68 are Hindus.
23 are Mahomedans.

254

ENGINEER GRADE.

Of these, 126 are Engineers; of the 126 Engineers only

11 are pure Natives, as to sources of supply,
12 are Royal Engineers,
13 are Stanley Engineers,
43 are Rurki,
38 are Cooper's Hill,

the rest being recruited elsewhere.

It will be seen that the Royal Engineering officers are in a small minority, as they have not joined the Provincial Branches for many years.

"Stanley" Engineers of course being no longer recruited, may be omitted from consideration.

6. The present sources of supply are only

Royal Engineers,
Rurki,
Cooper's Hill;

and as above stated, the Royal Engineers are gradually disappearing from these establishments, which will be left to Cooper's Hill and Rurki men. As Rurki now gives only 4 men one year and 5 men another to the whole Department, while four or five times as many come annually from Cooper's Hill, the North-Western Provinces Public Works Engineer Establishment promises to be composed mainly of Cooper's Hill men in the future, if the recruitment remains as at present. Whether this will be advantageous may be considered next under head No. 3.

UPPER SUBORDINATE GRADES.

7. For this part of the Department in the N.-W. Provinces, Rurki may be regarded as practically the one source of supply.

Rurki is acknowledged as the training ground for the upper subordinates of the Government of India, Public Works Department. At present about 25 men are required annually, and it may be assumed that they are recruited as follows:—

British Non-Commissioned Officers	11
European or Eurasian Civilians	7
Pure Natives	7

These proportions are found to be suitable. The Military Works Branch requires non-commissioned officers only, and these also are preferred for certain classes of works in the Irrigation Department, where self-reliance and prompt energy are indispensable to meet sudden emergencies and avoid serious failures involving destruction of works, failure of crops, and a loss of revenue.

The civilian Europeans are a superior class educated in hill schools, La Martinière, &c.

For some sorts of work, such as outlying provincial roads and buildings, Native Overseers are found especially useful, as they can be easily housed and sent lightly equipped to distant villages, and they can adapt themselves more easily to such conditions than Europeans. Some of these Native subordinates are very good and useful men.

LOWER SUBORDINATES.

8. Form a numerous class, all Natives and educated at Rurki, recruited chiefly from the schools of the North-Western Provinces and the Punjab. But as their salaries are under ₹100 per month, they are not included in the appointments under consideration by the Public Service Commission.

(iii) Comparative Capacities of the several Classes.

ENGINEERS.

9. It has been shown that under present regulations there are three sources of supply, (1) Royal Engineers, (2) Cooper's Hill, (3) Rurki, and the tendency is to let Cooper's Hill eventually supply the majority of the Engineers in the North-Western Provinces.

10. As to the comparative value of the sources of supply, there can be no doubt but that the Corps of Royal Engineers supplies the best men. They are the outcome of hard competition throughout, and have enjoyed a training not to be elsewhere surpassed, two years at Woolwich and two years at Chatham, and generally before coming to India they have served on works at home: they are the

cream skimmed off the outturn of Woolwich, and the *esprit de corps*, the discipline and the high traditions which they have to maintain tend to ensure their being a *corps d'élite*. In regard to education the primary training for a Royal Engineer or a Civil Engineer is the same: each enters on his practical work (where alone the art of Civil Engineering is very gradually learned) similarly equipped, the difference being only in the individuals and the amount of knowledge each has mastered. It is understood that the consideration of this source of supply is beyond the immediate scope of the Commission's enquiries, as the employment of Royal Engineer officers is a matter of Imperial policy: fields for training and employment must be found for them in times of peace, and while the public works of the country are greatly benefited in securing their services, the army also reaps much advantages in the powers of administration, skill in management of labour, familiarity with the resources of the country and its materials and modes of work, gained by its Engineers in the fields of the Public Works Department. The Military works are naturally entirely in the hands of the Royal Engineers, but the Railway Branch is a field especially suited and necessary for them, while the Irrigation Branch also offers in some of its branches of work opportunities particularly valuable for stimulating the qualities needed by the Military Engineer.

It is therefore in the interests of the Corps and also of the Public Works that a certain proportion of the recruits for the provincial branches of Public Works shall be taken from the Corps of Royal Engineers,—a measure which, as above pointed out, is now neglected.

11. In respect to the comparative merits of the Cooper's Hill and Rurki men, evidence is being everywhere collected by the Sub-Committee, who are also in possession of all the most valuable records of this office in respect to the evidence collected in past years as to the merits of those two classes of men, and the value of the Native Engineers in the Department in these Provinces, and also in regard to the opinions on these subjects recorded by General Fraser, General Brownlow, and numerous other officers of experience. On this point, therefore, it is necessary only to note that while value is attached to the advantage ultimately gained in his career by the Cooper's Hill man from his early English surroundings and the breadth of education thus ensured, yet that the Rurki man has many years' start of him in his practical Indian training, by his familiarity with the country, its people, languages, ways and resources, and that the best men of the two schools are much on a par. A glance at the distribution returns of the Public Works Department will show that many of the highest appointments and the charge of many of the largest works are in the hands of Rurki men.

12. There seems room for both classes, and the variety of characters, taste, and aptitudes secured by recruiting in two or three different fields is considered by many to be advantageous in a profession such as Engineering which opens varied fields suited to different men.

13. At present the number of men recruited from Cooper's Hill exceeds that admitted from Indian Colleges.

It may be considered advisable to lessen this irregularity: and if so, it may be noted that Rurki in the extent of its accommodation in quarters and class room, in the strength of its staff, and the numbers of candidates for admission, is capable, without extra expense to this Government, of training at least five times its present outturn, and indeed of supplying all the Engineers (in excess of the Royal Engineers) required for the Public Works of Northern India. The annual outturns of the Engineer Class admitted to appointments in the Public Works Department varied between 20 and 30 twelve or fourteen years ago.

14. Natives as well as Eurasians and Europeans domiciled in India enter the Public Works Department from Rurki. In the Entrance Examination the candidates of pure Native descent are not so successful as their more specially trained rivals, the latter working at the Hill School specially for Rurki, the former reading for their B.A. degrees. Once, however, in the College, the Natives hold their own and need no special concessions in their favour. Of this year's outturn two are Natives and two Europeans (domiciled in India).

15. If the Public Service Commission do not confine their considerations to only the present sources of supply, it may be noted of the "Stanley Engineers" (among whom are some of our best men) that the system failed. At first it secured, as was intended, young Engineers actually working in England. Eventually, however, there sprang up a class of candidates nominally practising Engineer apprentices, but actually boys working for the competitive examination while articled to Engineers and attending their offices only to satisfy the prescribed conditions. Such candidates have the advantages neither of education in a recognised Technical College, nor of the practical young Engineer on works. If any reversion to this mode of recruiting be contemplated, it would need careful revision.

16. There seems no hope of finding any other *Native* source of supply than the educated B.A. schoolmen of our higher colleges who receive their technical education at Rurki. The best and widest education is needed for our young Engineers, and cannot be dispensed with in favor of qualifications of good birth and high status unaccompanied by such education. Moreover, scions of the nobler families of the more warlike races of Northern India would not accept a career in the profession of Engineering, and it will be useless for many generations to look to the higher ranks of the Native community to furnish candidates for the Public Works Department of a type superior to the middle classes from whence our present stock of Native engineers is drawn, and so long will the decision remain that our Native Engineers want in the hardy energy, pluck, and self-reliance which are needed from an Engineer in charge of large works and in places of superior responsibility.

This, however, is a matter for consideration rather under the next head: that is

(iv) of the professional and other requirements of the different branches.

17. The actual qualifications required for admission to the several colleges and classes, to the several grades and branches of the Department, and for promotion to higher grades, are matters of fact recorded in regulations which will be supplied to the Commission by the Government of India.

18. Here only as matter of opinion it may be noted that the requirements of the Public Works Department (as of most departments of the Public Service) vary in different grades and branches: and that consequently different classes of men suit different positions.

19. Pure Natives fill admirably the lower subordinate grades, of which the salaries are below R100 and for which Europeans would be unsuitable.

20. In the upper subordinate classes there is room for the European non-commissioned officer, the "civilian" European or "Eurasian" and the pure Natives: each class is wanted and each finds suitable scenes and work.

The former is needed for works connected with troops; and his superior hardiness, energy, self-reliance, promptness and pluck render him an indispensable subordinate employé on canal head-works, and in similar positions where delay and indecision in emergencies would lead to great dangers and losses. For rough work on hill roads or in cold climates, these are the only suitable style of men.

The steadiest and best men of this class form our best subordinate agency, and indeed share many posts, such as those of District Engineers, with men of the superior Engineer classes.

Many of the civilian Europeans have very similar qualifications and are useful employés.

The Native upper subordinates vary very much. Some of them are of very poor stuff, but again, as before stated, some of our best upper subordinates are Natives, honest, intelligent and hard-working, and ready to work in Native villages and localities in the plains of India unsuitable to a European.

21. In the Engineer grades the qualifications required for the Assistant are chiefly that he should be intelligent, industrious, honest, and obedient. These qualities may be found in every class, European or Native. The Native as an Assistant forms a good Engineer and gives promise, which too often leads to disappointment in higher grades.

The Executive Engineer has greater responsibilities, needs more self-reliance and promptness, and his tact is brought into play in dealing with a wider range of fellow-workers. Here wider education and a more vigorous character come into play; the more English in temperament, traditions, and education the Engineer is, the better executive should he be. This points to the advantages of the English training of the Royal Engineer and the Cooper's Hill man. Many of the Rurki Europeans, however, with hereditary race characteristics, though domiciled in India, are scarcely behindhand. But the pure Native falls behind in the race, and though capable of holding charge of an ordinary division or district with efficiency and credit, needs more help and supervision from superior officers, and would not be selected for a division with very heavy responsible works, and where prompt relf-reliance and extreme activity and pluck were essentially necessary.

For Superintending Engineers and still more for Chief Engineers, administrative capacities are needed, and greater ability, broader views, and manner and character suited for a strong, yet sympathetic, rule of their juniors and for harmonious interworking with a diversity of men and departments.

To such posts pure Natives, for obvious reasons, have not hitherto proved suitable, nor are they likely to rise to such posts for some time to| come,—probably not before the necessity for a European control of the several Indian nationalities has ceased.

The opinions above expressed on the professional requirements of the several grades, &c., involve for the organization of our Indian Public Works Department the necessity for a very strong English element in the higher grades for the present and for a future with no appreciably early limit; for the Engineer Establishment a liberal employment of the best agency available, that of the Royal Engineers Corps; a proportion of Engineers with thorough English training such as furnished from Cooper's Hill; a proportion, moreover, larger than at present of the useful men furnished by Rurki.

For the upper subordinates also a strong English element in which the pick of the ranks of the army shall be represented by an annual selection of smart non-commissioned officers, and the Indian schools may furnish European or Eurasian youths of good education. Here, however, a larger field is open for Natives such as the upper subordinate classes of Rurki turn out.

The lower subordinate grades may be left entirely to Natives.

From this field occasionally exceptionally able men may rise to the higher grades in which a few of our best Native Engineers and upper subordinates owe their first training to this extensive lower field.

Existing Organization and Constitution of the Public Works Department in the North-Western Provinces and Oudh.

Department.	Total No. of Gazetted Appointments or of Appointments, not being merely clerical, of salaries of R100 and upwards.	Distribution of the Gazetted Appointments and other appointments mentioned in Column 2 amongst classes and grades, with rate of pay attached to each.		NUMBER OF APPOINTMENTS IN EACH CLASS OR GRADE NOW HELD BY						
		Class or grade.	Rate of pay.	Europeans not domiciled in India.	Europeans domiciled in India.	Eurasians.	Natives of India.			
							Hindus.	Mahomedans	Others.	Total.
1	2	3	4	5	6	7	8	9	10	11
			R							
P. W. Department.		Engineer Establishment.		GAZETTED APPOINTMENTS.						
	2	Chief Engineer, 1st class	2,500	1	...	...	...	...	...	...
		Ditto, 2nd „	2,000	1	...	...	...	...	...	...
		Ditto, 3rd „	1,800	...	...	...	...	...	...	...
	5	Superintending Engineer, 1st class	1,600	1	...	...	...	...	...	...
		Ditto ditto, 2nd „	1,350	1	...	...	...	...	...	...
		Ditto ditto, 3rd „	1,100	2	...	...	...	..	...	...
				...	1	...	...	...	...	...

Existing Organization and Constitution of the Public Works Department, &c.—continued.

Department.	Total No. of Gazetted Appointments or of Appointments, not being merely clerical, of salaries of R100 and upwards.	Distribution of the Gazetted Appointments and other appointments mentioned in column 2 amongst classes and grades, with rate of pay attached to each.		NUMBER OF APPOINTMENTS IN EACH CLASS OR GRADE NOW HELD BY						
				Europeans not domiciled in India.	Europeans domiciled in India.	Eurasians.	Natives of India.			
		Class or grade.	Rate of pay.				Hindus.	Mahomedans.	Others.	Total.
1	2	3	4	5	6	7	8	9	10	11
			R	GAZETTED APPOINTMENTS—*continued.*						
Public Works Department—*continued.*	62	Executive Engineer, 1st grade	950	6	2	...	...	...	...	...
				8	1	...	...	...	...	...
		Ditto, 2nd „	800	5	4	...	...	...	...	...
				7	1	...	...	...	...	...
		Ditto, 3rd „	700	6	3	...	...	...	...	...
				5	4	...	...	...	...	...
		Ditto, 4th „	600	3	1	1	...	...	...	...
				2	2	...	1	...	...	1
	59	Assistant Engineer, 1st grade	500	11	7	...	7	...	...	7
				15	3	5	2	...	...	2
		Ditto, 2nd „	350 with an increment of R50 after 3 years' service in grade	3	...	...	1	...	...	1
				4	...	1	...	...	...	...
		Ditto, 3rd „	250	Nil	...	...	...	...	...	...
		Apprentice Engineer	100	Nil	...	...	...	...	...	...
		Accounts Establishment—(for both B. R. and Irrigation Branches).								
	3	Examiner, 1st class	1,600	1	...	...	...	...	...	...
		Assistant, 1st grade	350	1	...	...	...	...	...	...
		Apprentice	100	...	1	...	...	...	...	...
		Revenue Establishment.								
	13	Deputy Magistrate, 1st grade	400	...	...	...	2	1	...	3
		Ditto, 2nd „	300	...	...	...	2	2	...	4
		Ditto, 3rd „	200	...	...	...	3	3	...	6
				NON-GAZETTED APPOINTMENTS.						
		Upper Subordinates.								
	90 (Non-Gazetted).	Sub-Engineer, 1st grade	400 (Civilians receive an increment of R50 after 5 years' service in grade and a second increment of 50 after 10 years' service in grade.)	3	...	1	...	...	...	...
				2	...	...	...	1	...	1
		Ditto, 2nd „	300	1	...	...	...	1	...	1
				1	...	...	...	...	...	...
		Ditto, 3rd „	250	2	...	...	1	...	...	1
				4	1	...	...	...	...	...
		Supervisor, 1st grade	200	4	...	2	...	1	...	1
				4	...	...	...	...	...	...
		Ditto, 2nd „	150	3	2	...	3	4	...	7
				2	..	1	2	1	...	3
		Overseer, 1st grade	100	...	...	...	13	3	...	16
				...	1	1	2	...	...	2
		Accounts Establishment—(for both B. R. and Irrigation Branches).								
	35 (Non-Gazetted).	Accountants, 1st grade	350 to 450 by annual increment of R20.	2	...	...	...	...	...	...
		Ditto, 2nd „	250 to 340 by increments of R15.	...	2	1	...	...	...	...
		Ditto, 3rd „	160 to 240 by increments of R10.	...	...	3	5	...	...	5
		Ditto, 4th „	80 to 150 by increments of R7.	...	...	...	21	1	...	22
		Revenue Subordinate Establishment.								
	8	Zilladars, 1st grade	100	...	...	...	3	5	...	8
				NON-PENSIONABLE ESTABLISHMENT ENTERTAINED BY DISTRICT BOARDS.						
	12	District Engineer, ungraded	450	...	1	...	...	...	...	...
		Ditto ditto	350	...	4	...	...	...	...	...
		Ditto ditto	300	...	2	...	...	...	...	...
		Ditto ditto	250	...	2	...	1	...	...	1
		Ditto ditto	200	...	1	...	...	...	...	...
		Ditto ditto	100	...	...	...	1	...	...	1

INDIA.

Public Works Department.

Note by the Acting Secretary to Government of Bombay, Public Works Department.

Appointments are made to the upper subordinate establishment in Bombay *primarily* from graduates (L.C.E.'s) of the University and from Royal Engineer soldiers.

Three appointments annually are guaranteed to the former class. Appointments from the latter class are made as required from time to time to meet more particularly the demand for service at Aden and in military stations. These men are of the class whose appointment is provided for in paragraph 35, Chapter II, of the Government of India Public Works Code.

It may be noted that that Code has been adopted in Bombay as a general guide since 1879, but its provisions are not all entirely applicable. In certain matters special regulations exist for Bombay,—*vide* paragraph 1, Chapter I. The system of appointing upper subordinates is one of the exceptions.

For the last twenty-two years the system has been to fix the proportion of Natives to Europeans in each grade. This was then (1865) decided on as preferable to the alternative of giving the European an extra allowance for the extra dearness of living. Government reserved the right of at any time modifying the proportion, "the object being that the rate of promotion should be fair to both Europeans and Natives."

Europeans on first appointment as a general rule enter the 1st grade of Overseers (pay ₹100): Natives as a rule enter as 3rd grade Overseers (pay ₹60).

The proportions in the several grades were last fixed in 1881. For the first three grades the numbers should be equal, but this was upset by an order of the Government of India of April 1884 (S.O. 295, dated 8th April 1884, now embodied in paragraph 49, Chapter II of the Code) under which four European Warrant Officers holding honorary commissions were ordered to be counted against the scale for upper subordinates, they having previously been regarded as outside that scale, and as extra to the Engineering Establishment in which they held rank in virtue of army rank.

The reversion of these four Europeans has caused the preponderance in the upper grade which has attracted the attention of the Sub-Committee. At the present moment there are some vacancies which are held temporarily in abeyance, but assuming these filled, the proportions are:—

		Europeans.	Natives.
Sub-Engineers	1st	8	3
	2nd	5	5
	3rd	11	10

Native promotions are not much slower than European. For instance, the junior Native Sub-Engineer was $5\frac{3}{12}$ years in grade of Supervisors (1st grade), while the junior European was $6\frac{5}{12}$ years in that grade.

Similarly the junior Native Supervisor was $3\frac{3}{12}$ years in rank of Overseer (1st grade), while the junior European served for $4\frac{10}{12}$ years in that grade before promotion.

In both these instances the Natives had considerably the advantage.

The junior Native Supervisor, 1st grade, served $5\frac{6}{12}$ years in 2nd grade, while the junior European served $6\frac{6}{12}$ years. Here again the Native had advantage. And so on.

30th July 1887. W. HUGHES.

INDIA.

Public Works Department.

Note by the Departmental Member, Madras,

India.
P. W. Department.
Section II.

On the subject of the more extensive employment of Natives of India in the Madras Public Works Department.

1. During the last twelve years very few officers of the Royal Engineers have joined the Madras Public Works Department, the reason being that since the establishment of the Royal Indian Engineering College of Cooper's Hill, the guaranteed appointments from that institution have left no vacancies for the young officers of the Royal Engineers. It is, therefore, only a question of time when the Department will be officered entirely by Civil Engineers.

2. At the present time the majority of the senior officers belong to the Royal Engineers, and hitherto the administration of the Department and the Engineering of all the most important works in the Madras Presidency have been vested almost entirely in Engineers appointed from England. It now has to be considered to whom these powers are to be entrusted in the future.

3. The points to be considered are the material available and the best means of technically educating and utilizing it in India.

4. The material may be divided into two great classes: English and Indian.

With regard to the first, the public and other schools in England send boys to Cooper's Hill, where they are educated for the profession of an Engineer, and yearly after competitive examinations fifteen of these young men are sent out to India to be placed under the different Governments as Assistant Engineers. The second class of material is scattered all over India, and consists of domiciled Europeans, Eurasians and pure Asiatics who have been educated at various schools and who, although placed under one classification as Natives of India, differ from each other in race characteristics in a more or less marked degree; and those who propose to become Engineers (using the broadest meaning of the word) can obtain a technical education at very small expense in the various Indian Engineering Colleges, from which Government now draws the bulk of its supply of upper subordinates. I need scarcely say that the schools in India from which the Engineering Colleges obtain their recruits are of the most varied description, some approaching the type of the ordinary large English school, while others, except in the theoretical training, are purely Asiatic.

5. At the College of Engineering at Madras, there are classes for Engineers and also for upper subordinates. This system I consider altogether wrong. To educate young men who will afterwards be officers and subordinates in the same Department in the same institution is distinctly a mistake that can only be partially justified on the grounds of economy.

6. My opinion is that there should be one College in India to educate in Engineering all Natives of India who can afford to pay for the advantages offered by the higher education. Bombay or Poona would, I think, be a suitable place for such an institution, which should be on the lines of Cooper's Hill, the education being for the Engineering profession, with a certain number of guaranteed appointments as Assistant Engineers under Government, to be competed for annually by the students who have completed their course of studies.

7. No upper subordinates should be trained at the College of Engineering, and the Colleges in India, which now educate both Engineers and upper subordinates, should have no guaranteed appointments to a higher grade than that of Supervisor.

8. Any attempt to recruit the Engineer establishment of the Madras Public Works Department from the Madras College of Engineering, or, in other words, from the Madras Presidency alone, would, I am sure, result in failure.

9. I look upon a broad distinction between the officers and subordinates of any department as an absolute necessity for its efficiency, and I consider that a College of Engineering on the lines of Cooper's Hill must be established in India, if it is intended to recruit the Engineer establishments in this country to any large extent.

10. The details of the scheme I have sketched would not be difficult to work out, and if the material exists in India out of which Civil Engineers can be made equal in quality to those now imported from England, I feel convinced that the best, if not the only, way of obtaining this material and technically educating it is to establish an Engineering College in India open to all who can afford to pay the necessary fees, and to place it as regards guaranteed appointments on an equality with Cooper's Hill as soon as the numbers under instruction justify such a measure.

11. I do not suppose that like Cooper's Hill the College in India will in time be self-supporting; but the demand for Engineers outside Government employment must increase with the growing prosperity of the country, and I have no doubt that in a few years after the establishment of such a College, the men who have been trained there as Engineers will from their higher education and superior social status readily find employment; and it is only just that the cost of this education to those who seek it should be fixed at something approaching the amount which young men in England are now readily paying for their technical training at Cooper's Hill.

Upper Subordinate Establishment.

1. I do not propose to consider any appointment in the Public Works Department below that of Overseer 3rd grade, pay R60 per mensem.

2. The grade of Overseer referred to is the lowest in the scale of the upper subordinate establishment.

3. The proportion of upper subordinates who would come under the classification of Natives of India is large at the present date,—133 out of a sanctioned establishment of 185.

4. The only points that appear to me to call for enquiry as regards the upper subordinate establishment are :—

i. the employment of Military upper subordinates,
ii. the supersession of Civilian Overseers, 2nd and 3rd grade, by the appointment of Military upper subordinates direct to the 1st grade of Overseer,
iii. the promotion of upper subordinates to the Engineer establishment.

5. In this Presidency, where there is no Military Works Department, I consider military upper subordinates are preferable to civilians for employment on works in connection with the Military Department, such as are constantly in progress at Madras, Bangalore, Bellary and other Military stations. I have heard it stated that these works do not require much engineering ability. This arises from a misconception of the work to be performed, which includes not only the construction and repair of the most valuable buildings in the Presidency, but also the Sanitary Engineering connected therewith, such as water and gas supply, drainage, &c.

6. Apart from their special utility at Military stations, I consider that military upper subordinates usually prove most valuable men to the Department when employed either in the Irrigation or General Branch of the Department. I would make no distinction between soldiers enlisted in England or elsewhere; all should, as now, be appointed to the Department as apprentice Overseers, 1st grade, after qualifying at the Civil Engineering College, with the exception of non-commissioned officers of the Royal Engineers, who might be appointed direct from the Corps to the upper subordinate establishment.

7. To avoid the supersession of civilian upper subordinates, I would keep the military men on a separate list for promotion.

8. In former years it was not uncommon to promote upper subordinates to the engineer Establishment of the Public Works Department, but of late years this practice has, rightly I consider, been discontinued, and in my opinion such promotions should only be made when the upper subordinate can be taken into the Engineer establishment when young. If the discipline and efficiency of a great Department like the Public Works is to be maintained, its officers must be trained and join as officers, whether they are appointed from England or in India.

India.

P. W. Department.

Section III.

Major G. F. O. Boughey

INDIA.

Public Works Department.

Section III.—Sittings at Calcutta.

WITNESS No. I.—*28th March 1887.*

Examination of MAJOR G. F. O. BOUGHEY, R.E., Manager of the Eastern Bengal State Railway.

The *President.*

How long have you served in India?—Twenty-two years. I have been seventeen years in the Public Works Department, and always in the Railway branch.

What are your views generally as regards the larger employment of Natives in connection with State Railways?—I am the Manager of a State Railway, which is in fact a large commercial business. My working is pretty closely scrutinized both as to efficiency and economy. My experience is the same as that of the heads of private commercial undertakings. Natives are very largely employed under me, but under a very costly system of European supervision. If I could get this supervision done as well and more cheaply by Natives, I should of course employ them. There is a Government of India Circular of 1879, ordering Natives to be employed particularly in the higher posts of the Traffic Department when suitable men can be obtained. I don't know of any such men, and have no means of obtaining them except by recommending the promotion of subordinates, a practice I should resort to very rarely and cautiously in the case of either Europeans or Natives. I have so much to do in getting the best out of the materials I have to work with, that I can offer no opinion on the best way of getting Natives who are fitted to fill the higher posts. One great difficulty at present in the way of employing Natives in the higher supervision on railways is the large amount of European labour and subordinate supervision still employed. When this in time is reduced, the higher supervision by Natives may possibly follow.

What class of Natives generally do you consider fittest for the Engineering department? Suppose you were set to lay a line of railway, what class would you employ?—Natives chiefly for the labour and subordinate superintendence, and for the higher superintendence—that is, for the officer class—Europeans.

Among the Engineer staff employed on railways as the higher supervising staff, are there not numbers of Royal Engineers?—There are not many Royal Engineers at present employed on railways. The upper Engineering staff is mainly composed of Civil Engineers with one or two Natives among them.

How many Royal Engineers are employed on your Railway?—Not any.

How many Civil Engineers have you in the upper posts?—The Department is headed by the Superintendent of Works. He superintends the whole Department under me. He is a Civil Engineer, and under him there are several divisions, each under the charge of an Executive Engineer, with one or more Assistants.

The *President*—contd.

Have you any Natives employed in this branch of the Railway service?—I have at present one Native in the superior establishment.

Where was he educated?—I do not know. He gets ₹500 as 1st grade Assistant.

And all the other employés are Europeans?—Yes, that is in the higher superintendence.

Are they all men who came out from England?—No. They came from various sources. The Government when it lately took over the Railway, of which I am Manager, from the late Eastern Bengal Railway Company, also took over some of the Engineers of the Company. Some of the men were educated in England, and some of them were educated out here, but I think all of them have had some English experience. I fancy all of them received their general education in England. I do not know whether they had received any technical education before they came out to India. We have five Engineers and two Assistant Engineers in our upper supervisional grade. Of the five Engineers in this grade three were taken over from the Company, one of them being a Native. One is a Stanley Engineer; another, the Native, was taken over by Government when they took over the Nalhatti line of the Oudh and Rohilkund Railway. The two Assistant Engineers have been temporarily engaged by me for special work. One of them received his education in England; the other was, I believe, educated in India.

The Hon'ble Mr. *Quinton.*

Are men promoted from the Assistant Engineers to the supervisional grade?—Yes. In the upper subordinate establishment there are three members: one is a Native who came to us from the Punjab; one is a Swede, who was brought out to this country by the Directors of the late Company, and has remained with the Railway since; the third is a European. He came out under an agreement with the Company.

How many subordinate Superintendents have you?—We have eight Permanent-Way Inspectors on salaries varying from ₹90 to ₹100. Of these, one is a Native and two are East Indians and five Europeans. None of the Europeans were born in the country. The Native has risen from a subordinate grade on the line. Most of the Europeans were taken over from the Company.

Why do you not employ more Natives?—The present staff is chiefly composed of the men we took over from the Company.

Do you find Natives, men who are qualified for the work, willing to take appointments as Permanent-Way Inspectors?—I think the difficulty is

The Hon'ble Mr. *Quinton*—contd.

to get qualified Natives for the posts of subordinate Superintendents.

Which of the different classes of Engineers employed in this country are, in your opinion, most fitted for railway service?—Cooper's Hill Engineers or men educated in the local Engineering Colleges.

Do you consider that the men educated in the local Engineering Colleges are as efficient as the men educated at Cooper's Hill?—Not as a rule, but there are some good men among those who have been educated at the Indian Engineering Colleges.

In what respect are they inferior?—It is very difficult to say. I think a great deal of the superiority of the Cooper's Hill men is owing to the public school system which makes them manly and gives them force of character and administrative capacity.

You think much of their superiority is due to the superior general education which boys receive in England?—Yes.

Are you acquainted with the course of study pursued at Rurki?—I know something about it.

Is there any difference in the course of study pursued at Rurki and that pursued at Cooper's Hill?—It is difficult to say.

Have you had any Cooper's Hill men serving under you in the lower branches?—Yes.

And Rurki men also?—Some.

The *President*.

In your opinion is the system of education at Rurki capable of improvement?—I doubt whether the deficiency is so much in the system as in the class of material you have to work on.

With reference to your remark about some Rurki students being wanting in characteristics which lads trained in England have, can you say whether among the Rurki Engineers you have had under you there were men who were born in India of European parents?—I do not recollect sufficiently to enable me to say. I have not had a Rurki man under me for some time.

Have you a Locomotive Superintendent in your Locomotive Department?—Yes.

Was he educated in England?—Yes.

He is not a Cooper's Hill man?—No; he came to us from the East Indian Railway. The Assistant Superintendent also received his education in England and came to us from the Bengal and North-West Railway. The second Assistant Superintendent was the son of a former officer on the railway, and has received some portion of his technical training in England. That is the whole of the superior staff; most of the subordinate Superintendents we took from the Railway. For information as to the Traffic Department, I had better refer you to Mr. Barclay, who is present. In the Store Department we have two Europeans in charge. The Storekeeper belongs to the general list of Railway Storekeepers employed by Government. He is also a Port Storekeeper,—that is to say, he receives all railway stores landed in Calcutta for all lines. The Assistant Storekeeper gets ₹250. That office is now held by a European transferred from the Accounts Department. His father, I believe, settled in India. As to the Audit and Accounts Department, you will obtain all the information you want from Mr. Quinlan.

The *President*—contd.

Are there any rules which exclude Natives from these departments?—There is no rule in any department of the Railway which excludes the employment of Natives in any capacity for which they may be qualified; on the contrary, there is the Secretary of State's Order of 1879, to which I have already referred, which prescribes that they shall be appointed wherever competent men can be found.

I believe in the Accounts department, Natives are more largely employed than anywhere else?—Yes.

Do you consider there are a sufficient number of schools in India for training men for the Engineering departments?—Yes, their number is sufficient.

The Hon'ble Mr. *Quinton*.

Have you any men on your line who were educated at Seebpore?—No.

Mr. *Ryland*.

Do you not think it possible that openings in life might be found for such men on the State Railways?—Yes. I do not see why they should not come forward more for subordinate Superintendentships to begin with.

And if they did come forward, do you think they would have a chance of getting these appointments?—Yes, if they were sufficiently educated. The principles which I have already stated and the observations I have made apply equally to the other lines of State Railway of which I have at present charge, *viz.*,—the Northern Bengal and the Dacca Railways.

Is there any other point which you would like to bring forward?—No.

WITNESS No. II.—*28th March 1887.*

Examination of W. NICHOLSON, ESQ., C.E., Superintendent of Ways and Works, E. B. S. Railway.

The *President*.

You are Superintendent of Ways and Works on the Eastern Bengal State Railway. Did you receive your education in England?—Yes. I came to India in 1859. I received my technical education in India under Mr. Purdon, Chief Engineer of the Eastern Bengal Railway. He brought me out. I have been on the Eastern Bengal Railway during the whole of my service in India, with the exception of one year during which I have been in Government service.

The *President*—contd.

India.
P. W. Department.
Section III.
W. Nicholson, Esq.

The *President*—contd.

Have you any experience of the Engineers who have been trained in this country?—No. I had one man under me for a short time only, and therefore I cannot form an opinion as to their merits or otherwise.

Have you served with any Natives holding Engineer appointments on the Railway?—Yes, I have had one man with me for about five years, and another for about two years.

Have you had such experience of Natives as Engineers that you could form any opinion of them as a class?—No.

Mr. *Ryland.*

Do you think it possible to acquire at the Engineering institutions of this country sufficient technical knowledge for the efficient discharge of the duties of railway Engineers?—I consider that you can obtain sufficient technical instruction there, but the difficulty is to get the students to apply for the railway appointments.

What is the difficulty?—I think the men are wanting in fitness for independent positions. They always appear to require instructions for everything they do.

Witness No. III.—*28th March 1887.*

P. D. Barclay, Esq.

Examination of P. D. Barclay, Esq., Traffic Superintendent, Eastern Bengal State Railway.

The *President.*

You are Traffic Superintendent of the Eastern Bengal State Railway. Will you tell us how the personnel of your department is composed?—There are six members of the upper superior establishment in my department, including myself. Of these three were taken over from the late Eastern Bengal Railway Company; two are, I believe, sons of Eurasians or domiciled Europeans; the others are Englishmen. Of the upper subordinate grade there are five members, all Europeans, and all were taken over from the Company.

Are your Station Masters principally Europeans or Natives?—The great majority of them are Natives.

What salaries do they receive?—From ₹25 to ₹90. There are, besides, certain large stations managed by Europeans on salaries up to ₹240.

How many Traffic Inspectors have you?—Six; one is a Native, five are Europeans. They get from ₹170 to ₹300. They rank above the Station Masters.

What is your experience of Natives as Station Masters and Traffic Inspectors?—The one Native Traffic Inspector I have had has done his work very well on the whole. That is the only experience I have had of Natives as Traffic Inspectors.

And as Station Masters, do you find them satisfactory?—As Station Masters of small stations, where they have not to do with many European subordinates, they are very well.

Have you any race objection to the appointment of Natives as Traffic Inspectors or as Station Masters if they are in all respects fit for the duties of those posts?—None, beyond that a man supervising men of his own caste and race is more open to undue influences, a failing which we cannot altogether get rid of; and, therefore, in Bengal, I would prefer to see other than Bengalis in those positions. For the inspection of Station Masters,

The *President*—contd.

especially, I think it necessary that we should have a man of another race, though not necessarily a European; but otherwise I see no reason why we should not employ Natives of any class in this country, in any part of the Traffic Department, provided they are fit for the duties.

What are your reasons for considering it desirable to appoint a person of another race as the Inspector of a Bengali Station Master?—My reason is, that I find that Natives are so much influenced by ties of caste and family, that the efficiency of their supervision is interfered with, and I have less dependence on them.

I presume that the object of a Traffic Manager on a State Railway is the same as would be the object of a Traffic Manager on a Railway owned by a private Company, *viz.*, to work the traffic as cheaply and efficiently as possible?—Yes.

Do you find that educated Native labour is cheaper than European?—Not the best Native labour.

Mr. *Ryland.*

What is your reason for having Europeans in charge of large stations; what are the qualifications you look for in the management of large stations?—Self-reliance, experience, sobriety, and freedom from the influences I have mentioned. The Master of a large station has a very large staff under him, and he ought to be able to command them in every way. In fact, we find that Europeans do the work better.

The Hon'ble Maulvi *Abdul Jubbar.*

You have no objection to the appointment of Parsis or Mahomedans for the inspection of Hindu Station Masters?—No; supposing a fairly qualified Parsi or Mahomedan were available, I would employ him. We take the best men we can get for the work.

Witness No. IV.—*28th March 1887.*

S. Finney, Esq.

Examination of S. Finney, Esq., Assistant Manager, Eastern Bengal State Railway.

The *President.*

You are an Englishman by birth?—Yes.

And educated at Cooper's Hill?—Yes.

When did you come to India?—At the end of 1874; I was appointed by the Secretary of State. I was first employed on the Northern Bengal Railway. It was then a State Railway. I was eight years and three months on that railway, and then I went to the Southern Mahratta Railway for about a year and a half, and then I joined the Eastern Bengal Railway.

The *President*—contd.

The *President*—contd.

Will you give us your opinion as to the employment on State railways of Natives and others born and trained in this country?—I think that whenever they can be employed, they can be employed with advantage.

What is the lowest supervisional appointment on your Railway?—A Station Master's. Some of the Station Masters get R25.

Do you consider that Natives should be employed in the supervising department of the Eastern Bengal Railway as far as it is possible to obtain fit men for those appointments?—I think so.

Have you any experience of the men trained at Rurki?—Yes.

Have you found them efficient?—As a rule they are efficient.

Are you acquainted with the system of technical education which is pursued in the upper class at Rurki?—No.

Then you cannot form a comparison between that system and the system of education pursued at Cooper's Hill?—No.

Have you any observation to make as regards the system of admission to be pursued in making appointments to the superior ranks in the Railway service?—I consider that the best men for the superior ranks come from England.

Do you attribute their superiority to the technical or general education they receive there?—I attribute it more to the general education they receive. I believe they could get as good a technical education in this country as they do in England. Of course they would not have the same opportunities of acquiring experience on large works before they are appointed to the service that they have in England.

What is the system which governs the admission of students at Cooper's Hill College to Government service?—Engineers who enter Government service in this country from Cooper's Hill do not now pay for admission to that institution, but compete for their appointments on completing their course of technical education; or rather the appointments are offered to the men who have passed out highest, and the ten best men of those who are willing to serve in this country receive them.

The Hon'ble Mr. *Quinton*.

Do not students at Cooper's Hill pay for their education there out of their own pockets?—Yes. The College fee is £180 a year.

What would be the cost of an apprenticeship to a Civil Engineer?—For an education as Mechanical Engineer a premium of £100 a year is charged at the first class works; and, I believe, the first class Civil Engineers in England demand a premium of 300 guineas from their pupils.

The Hon'ble Mr. *Quinton*—contd.

Are the pay and promotion rules of your service sufficient to attract good men from Cooper's Hill?—I have been disappointed in the pay and prospects of the service, but I cannot say that the men who now come out from Cooper's Hill are not as good as the men who came out when I did.

Have you reason to be satisfied with your leave rules?—Yes, I have no complaint to make about them.

And as to your pension prospects?—The uncertainty of the rupee induces us to desire that our pensions should be settled in sterling.

Mr. *Ryland*.

Is there any liability of men in your department being superseded by men from other departments?—Not in my branch of the department; but men have been transferred from the Military Works Department to the ordinary Public Works. The Military Works Department was formerly a branch of the Public Works Department and promotion is more rapid there than in the ordinary branch.

Does that create any discontent?—It has done so.

The *President*.

Do you know whether the employment of Military Engineers on civil works is regarded by the Government as necessary as ensuring the existence of a staff of Engineers competent for all emergencies in time of war?—Yes.

Do you mean that Military men have been transferred to the Ordinary branch in too great numbers?—When I spoke of discontent I did not refer to the Ordinary Public Works, but to the Military Department, where promotion is more rapid than in the Ordinary branch. I do say, however, that it is a hardship on men in the Ordinary branch that officers who have received more speedy promotion in the Military Works branch are placed over their heads. I know there have been complaints made on this score, but I cannot say that I myself have been at the pains to ascertain whether they were well founded.

The Hon'ble Mr. *Quinton*.

When you got your appointment from Cooper's Hill, was any pledge given to you by Government that promotion in the Ordinary branch would be given solely to Cooper's Hill men?—No.

WITNESS No. V.—*28th March 1887*.

Examination of E. P. QUINLAN, Esq., Examiner of Accounts, Eastern Bengal Railway.

E. P. Quinlan, Esq.

The Hon'ble Mr. *Quinton*.

You belong, I believe, to the Accounts branch of the Public Works Department?—Yes. I have served for eighteen years in the Accounts department. I was educated partly in England and partly in France. I came out to India in the employ of the Madras Railway Company.

The Hon'ble Mr. *Quinton*—contd.

I was in the employ of that Company, I think, about three and a half years.

How many officials are employed under you in the Eastern Bengal State Railway?—Fifteen; and out of these fifteen, seven are Europeans or Eurasians and eight pure Asiatics. The salaries

India.

P. W. Department.

Section III.

E. P Quinlan, Esq.

The Hon'ble Mr. *Quinton*—contd.

of the employés in the Audit branch range from ₹100 up to ₹1,100. The Head Examiner, that is myself, gets ₹1,100, and the Deputy Examiner ₹500. The superior establishments of the department are recruited from three sources: (1) selection of men supposed to possess some technical knowledge of accounts; (2) selection of men from the Executive branches,—*i.e.*, Railway Engineers, Military Officers and Civil Engineers; and (3) selection from the subordinate Accounts establishment.

Are promotions made to the higher grades from the lower, or are men brought in direct to the higher grades?—Sometimes officers are brought in direct, but otherwise the appointments are by promotion from the lower grades.

Is there any reason why the duties of Deputy Examiner should not be performed by a Native officer?—None whatever.

Or those of Head Examiner?—The duties of Head Examiner are very peculiar. He is intimately connected both officially and personally with the heads of departments. He is present at the fortnightly meetings of the latter, where questions are discussed which very intimately affect the personnel and the staff; and therefore it is necessary, I think, that he should be acquainted with the social habits and ways of thinking of Europeans; and, besides that, he has the conduct of the important correspondence which goes on between the heads of the departments and the Board of Directors in England. I do not think that the class of Native we have hitherto been able to attract to the Department possess the necessary education to fit them for the headship of an important office.

But supposing the educational qualifications are equal?—Strength of character, capacity to control men, is required as well as book-knowledge. One Native Assistant has recently been made an Honorary Assistant on ₹450 in the Punjab. That is a man I thought very highly of when he was under me.

Mr. *Ryland.*

Have you perceived any tendency in Natives to fill the lower appointments with men of their own class or caste to the exclusion of others?—That would not be possible under our arrangements, because every man who comes in to the office has to pass a preliminary examination.

Suppose the Examiner himself were a Native?—I have known of an instance when a man who was officiating as Examiner did actually surround himself with a very large number of his friends. It was my unpleasant duty to have to dismiss these men.

Mr. *Ryland*—contd.

What is the nature of the examination they have to undergo in order to be appointed graded Accountants?—They have to pass the two distinct tests which are laid down in the Code (Chapter I, Part 16).

The Hon'ble Maulvi *Abdul Jubbar.*

Have you any Mahomedans among the Accountants?—I have only been able to obtain one. Mahomedans do not come forward at all. The one I refer to is in charge of my printing work on a salary of ₹50.

Mr. *Ryland.*

Have you among the Accountants any who have been brought up in the schools here?—A few.

How do you appoint them?—If they have passed a fair educational test in the schools, they are taken into the office as probationers on a maximum pay of ₹30; but they may not rise beyond ₹50 unless they pass the test prescribed by the Code. I am sorry to say that, with one or two exceptions, the men we have had of this class have not turned out well. They are generally lazy, useless, and indolent. My experience is that Natives are preferable to work with. I am not referring to Eurasians from the local colleges, of whom I have none under me, but to parochial schoolboys who have not passed any high standard of education. There is a want of energy also amongst the Native B.A.'s in my office. I have had five of them, and three have been useless, because they did not care to undergo the labour required of them. The remaining two are doing fairly well.

The *President.*

Is there any other point you wish to bring to our notice?—Yes, with regard to our leave rules. We see officers with the same responsibilities and duties as our own who enjoy much more favourable leave rules. For instance, I can only get two years' leave in my whole service, and it counts against pension. There are other disadvantages under which we officers of the Uncovenanted Service labour. Domestic life is almost impossible for us. I have never myself been more than three years in one station.

Mr. *Ryland.*

As regards promotion, are you liable to be superseded by officers from other departments?—I have nothing to complain of in that way; but I have heard of instances of such supersessions; but whether there were good reasons for them I do not know.

WITNESS No. VI.—*28th March 1887.*

J. B. Braddon, Esq.

Examination of J. B. BRADDON, ESQ., Examiner of Accounts, Public Works Department.

The *President.*

When did you enter the Service?—I have been fifteen years in the Service, out of which I have spent thirteen in the Railway Branch. I am at present Examiner of Accounts in the Public Works Department, Bengal.

The *President*—contd.

How are men admitted into the lower grades of the Accounts Department?—By examination and nomination. The rules are laid down in the Code. As regards the upper grades, the mode of admission is by an educational test and nomination by

The *President*—contd.

the Accountant-General, the selected candidates being taken on as apprentices. The lowest post in the higher grades is that of Assistant Examiner. The test which the candidates for the upper grades undergo is not a competitive but an educational one. The men are nominated on application. They have to produce certificates. The appointments in the higher grades are made by the Government of India,—in the lower grades by the Accountant-General or Local Governments, as the case may be.

Are more candidates nominated than there are vacancies?—It rests with the Accountant-General to nominate. Anyone can apply to be examined. The papers are set by the Civil Engineering College; and those who pass can be appointed by the Government of India on the nomination of the Accountant-General. The appointments are made after the examination; and it does not follow that a candidate who passes the examination is appointed. The superior grade of the Department consists of one Examiner, a second Examiner, one Deputy Examiner, and one Honorary Assistant Examiner. The lower grade consists of Accountants of four classes. The present Examiner and second Examiner are Europeans; the Deputy Examiner is a Eurasian, and the Honorary Assistant Examiner is a Native of Bengal.

In what places have you served?—In most parts of India—Secunderabad, Kathiawar, Rajputana, Cawnpore, Lahore, Sukkur, Bombay, and Calcutta.

Have you had Natives largely employed under you in the Accounts Department?—Yes.

I believe there are domiciled Europeans and Eurasians who have risen to high posts in your Department?—Yes, one of them has risen to be the head of the Department; another, a Eurasian, is a Deputy Examiner in my Department; only one pure Asiatic is employed in the higher branch. He is the only Native I have had to do with. That was at Sukkur. He was very nearly as high as myself in the Department and was altogether an exceptional man. So far as technical ability, knowledge of accounts, and grasp of subjects went, he was efficient, but he was wanting in the other qualities requisite to administer an office. I refrain from giving details; my opinion is based on an experience of his work during a certain period in which he had charge of my appointment. He is the only Native at present permanently in the higher grades of Honorary Assistant Examiners and is not eligible for promotion.

The Hon'ble Maulvi *Abdul Jubbar.*

Was any specific instance of inefficiency in the person you allude to ever brought to your notice, or of that administrative ability of which you say he was wanting?—No specific instance was actually recorded.

The *President.*

What are these Honorary Assistant Examiners?—I cannot quite understand what they are. They are subordinates and officers at the same time. It is optional whether you allow Honorary Assistant Examiners to perform the duties of an officer or not.

What is the objection to making him an Assistant Examiner to all intents and purposes?—One

The *President*—contd.

is that he would probably be required to rise higher, to which there would probably be an objection. The Honorary Assistantship is supposed to be the highest grade he can attain to. I have not found that the system works well so far, as far as Europeans are concerned. Natives, as a rule, accept that position, but with Europeans it is often a little difficult. They think they should be treated as officers, whereas in some respects they are subordinates.

I believe the technical knowledge which is required of candidates for the Accounts Branch of the superior establishments is very small?—There is none required. We are supposed to acquire it in the Department.

Is it not desirable that they should possess some?—Decidedly so.

Mr. *Ryland.*

The Eurasians you speak of were not men who have distinguished themselves at any of the public schools?—No; they are of the class we get in as Accountants in the lower grades.

Have you known a gentleman who entered the army as a private soldier and rose to be head of the Public Works Department?—Yes. My views on the subject of the present enquiry are as follows (*reads*).

My experience has been chiefly in the Railway Branch during my 15½ years' service in Department, of which 13 years in superior grades and 8 years past in independent charge of offices in various parts of India.

I wish to say that the Railway Branch (Accounts) should be kept quite distinct from the rest. Separation should extend as far as possible to all grades, superior as well as subordinate. Their requirements are different. Accounts officers and men in the Railway Branch should be now pensionable and somewhat better paid; if interchangeable, localizing subordinate establishment is preferable, if possible.

Accounts establishment on provincial lists should also be kept distinct.

The present rules as to preliminary examination for admission into superior subordinate grades are well enough as far as they go. They ensure a fairly good education on the part of candidates. More attention might be given to question of technical education prior to admission to branch. For subordinate grades (Accountants), a training school, forming part of one of Government Engineering Colleges, might be formed for mercantile book-keeping, and a graduate of this school brought in at a somewhat higher initial pay.

As far as my experience goes, our Accountants are not, as a body, proficient in this essential particular.

For efficient service in the higher grades, more important qualifications are needed,—*viz.*, grasp of details, administrative ability, &c.; but officers should have previous training in accounts if possible. Apprenticeship to firms of Public Accountants or men who have seen service in banks or public companies should be encouraged by allowing candidates so qualified, provided other conditions, as to educational tests, &c., were fulfilled, to enter at once in the higher grade. The practice of putting Royal Engineer officers into this

India.

P. W. Department.

Section III.

J. B. Braddon, Esq.

The *President*—contd.

branch is certainly not conducive to efficiency; as a rule, they have had no previous training in accounts work, and their tenure of office is usually understood to be only temporary.

As to pay, pension and furlough of officers and subordinates, reform and improvement are certainly needed, to make the service attractive, and present occupants of offices contented. The anomaly of two officers doing the same work, drawing the same pay, with like responsibilities, and presumably of equal merit, being so differently placed as regards leave and pension, as is the case at present, requires to be removed.

Leave.—Favourable rules. C. L. Code, Ch. 1., 2, give conditions

Pension.—C. E.'s counting furlough, though serving in Accounts Branch. Uncovenanted not doing so.

Natives are, no doubt, well fitted for the work of the subordinate Accounts Branch. Quick at figures, and, in most cases, they have good memories.

Eurasians are very useful in this line, and amenable to discipline.

Europeans are necessary for higher grades of Accountants.

Natives and Eurasians can live on less than Europeans, and do not require such high pay or so much furlough. *Ergo*, their employment in the subordinate grades of the lower ranks is desirable on economical grounds if equal proficiency can be obtained. The Accounts Branch comprises, roughly, in the subordinate grades, Natives and Europeans (including Eurasians), as 2 to 1. This is a fair proportion.

As regards the relative advantages and disadvantages of employment of Europeans, Eurasians and Natives in the subordinate Accounts grades.

Europeans.—Disadvantages:—(*a*) require higher pay, (*b*) difficulties as to accommodation if sent to divisional offices, &c., (*c*) require more furlough.

Memo.—Bhavnagar. Quetta. Jhansi. Beluchistan.

Advantages:—Greater stamina and pluck (as was shown in 1885 in S. P. and B. Railways), higher degree of intelligence in general subjects, fitness for control of their subordinates.

Eurasians.—Disadvantages:—Sickly constitutions, as a rule; want of influence over others, and of strength of character.

Advantages:—Can be had on lower pay; are good, as a rule, at figures and clerical work; amenable to discipline.

Natives.—Disadvantages:—Unwillingness to be moved about the country (this, however, would not need consideration if employment were *localized*); tendency to mechanical method of business; *race* feelings.

The *President*—contd.

Advantages:—Quickness in work; to be had on lower pay; should not require the same furlough as Europeans. As regards employment of Natiyes in the *superior* Accounts Branch, it is difficult to offer an opinion, as the plan has not had a trial. There is only one Native at present in the superior grades, and he is a very exceptional man.

The disabilities of Natives* for the superior grades seem to be—

* *i.e.*, of such as seek admission to the Department.

(*a*) their want of administrative ability;

(*b*) caste prejudices;

(*c*) difficulties which would arise in personal communications with European officers of corresponding rank;

(*d*) lack of confidence in their impartiality on the part of their subordinates.

In my experience I cannot call to mind one single Native in the subordinate ranks with whom I have had dealings, whom I should consider fitted for the responsibilities and equal to the requirements of the Accounts Officers' grade. I mean with regard to those qualities apart from technical acquirements which are requisite for efficient conduct of the duties. At the same time I do not see any reason why Native *gentlemen* should not be admitted to the higher grades if such can be induced to enter. The capacity of the Natives for accounts, their steadiness and studiousness render them peculiarly fitted for employment; and if to this is added integrity, impartiality, and self-reliance, there should be no reason for precluding them from the higher grades; but they should, in my opinion, be satisfied with lower remuneration, less furlough, and smaller pensions than are given to European gentlemen who fill the posts. The reasons are well known, and need not be brought forward.

The Hon'ble Mr. *Quinton.*

What was the occasion you allude to as having called for special courage and endurance?—The outbreak of cholera among the workmen on the Bolan Line of Railway. The Natives, for the most part, went away on sick leave. They did not exhibit the same endurance as the Europeans.

The Hon'ble Colonel *Trevor.*

Have you not known of instances in which Natives in charge of large gangs have made excellent arrangements to meet outbreaks of cholera?—Yes. I had practical experience of the want of endurance of Natives on the occasion I mentioned, as I had to pass the accounts, and was continually getting letters saying that the Native Accountants were going away on sick leave. My experience was that the Europeans exhibited much greater endurance than the Natives did.

Witness No. VII.—*28th March 1887.*

W. B. Bestic, Esq.

Examination of W. B. Bestic, Esq., C.E., Junior Secretary to the Government of Bengal, Public Works Department, in the Department of Roads and Buildings.

The *President.*

You received your technical training at Cooper's Hill, I believe?—Yes. I was appointed by the Secretary of State in 1879, but I had a year's

The *President*—contd.

practical training in Sir William Armstrong's workshop at Ellerslie, Newcastle-on-Tyne, before I came out to India in 1880.

The *President*—contd.

You have been Examiner of the students at Seebpore College?—Yes, I examined them at the re-examination in 1880 and 1885, with another gentleman.

Are you acquainted with the course of instruction pursued at Seebpore?—So far as I have been through the examination papers.

In your judgment is it inferior to that afforded at Cooper's Hill?—There is very little difference between the two so far as the curriculum laid down is concerned; but there is a great deal of difference in the practice.

Are you at all acquainted with the Rurki College men?—No.

Do you know the course of study which is pursued at Rurki?—I believe it is similar to that at Seebpore.

Do you know whether the standard attained is higher?—I do not. Judging from the results so far as I have seen them, I should say it was the same.

In what subjects do you consider that a sufficiently high standard is not attained?—In Engineering and in applying mechanics.

Are there any reasons for this deficiency?—I do not consider that the general education of the men when they go into the College is sufficient to enable them to take advantage of the technical training to the fullest extent.

The *President*—contd.

Are the Rurki College students a better class than those at Seebpore?—I cannot say.

The Hon'ble Mr. *Quinton*.

Among the students at Seebpore there are domiciled Europeans and Eurasians as well as Natives?—I know that of the four students who went up for their degree examination in 1885 one was a domiciled European; and I judge from the lists of students that it contains a much larger percentage of those classes than Rurki.

The *President*.

What school were you at before you entered Cooper's Hill?—I studied in France and Germany and at King's College. I entered Cooper's Hill by competition, and had to undergo a severe preliminary examination in general education before being allowed to compete. The year I was Examiner in the University here for the Engineering degree, four students presented themselves, of whom two failed and two passed. Of the latter, I consider one, so far as his Engineering papers were concerned, would have passed at Cooper's Hill; the other would not have done so.

WITNESS No. VIII.—*28th March 1887*.

Examination of JOHN WILCOCKS, ESQ., C.E., Assistant Engineer.

J. Wilcocks, Esq.

The *President*.

I was born in India. My father was in the service of Government in the Public Works Department. He died in India. My mother died in India during the Mutiny, and I was educated in India at Mussoorie under Mr. Maddocks. I entered Rurki College in 1877 and left it in 1879. I obtained the Council of India prize of ₹1,000 as the most distinguished student, the Thomason gold medal for the best engineering design, and prize for Experimental Science, Drawing and Surveying. I was appointed Apprentice Engineer to the Public Works Department, and was employed successively in the Punjab Northern State Railway, the Nagpore Railway Survey, and the Tirhut State Railway. Two students are sent to England yearly by the Government to undergo practical training, and in 1885 I was selected by the Government of India. I have just returned. I elected to study Architecture and was sent to Mr. Spires, an Architect in London. Under his direction I employed myself principally in making architectural drawings and in preparing architectural designs. I was thus enabled to acquire knowledge which I could not have acquired in India. In the first place I learnt the principles of Architecture and obtained a practical knowledge of types of buildings of which we have few instances in this country. Rurki and Cooper's Hill Engineers are on the same footing as regards pay and promotion; except that the former are paid a lower salary for the first 18 months of their service. I have no complaint to make respecting pay, but

The *President*—contd.

there is a great difference between Rurki and Cooper's Hill men as regards leave. We have only one year after ten years' service; they have two years after eight. In the whole period we have only 2 or 2½ years' leave and no portion of our furlough counts for service. In the case of Cooper's Hill men two years' leave in 20 and three in 25 counts for service. Also we are not under the same rules as the Cooper's Hill men respecting pension. Formerly about 8 men annually passed as Engineers from Rurki. I consider the men I know were, on the average, not equal to Cooper's Hill men from the mere fact that they had never been in England. The latter have had advantages of seeing large works which we could not see in India, and their general education is somewhat superior to that of the average Rurki student. I consider that the professional instruction given at Rurki, so far as books and laboratory works are concerned, is not inferior to that which the average Cooper's Hill man gets; and if a Rurki student obtains the advantage of training in England after he has had some practical work in India, I certainly think he will be not inferior to a Cooper's Hill man of equal intelligence.

The Hon'ble Maulvi *Abdul Jubbar*.

There were three Native students who passed out of Rurki College with me. I entered by competition. There were 40 competitors for ten places; seven were obtained by Englishmen and three by Natives.

India.

P. W. Department.

Section III.

F. J. E. Spring, Esq.

WITNESS No. IX.—*28th March 1887.*

Examination of F. J. E. SPRING, Esq., L.C.E., M.L.C.E., Under-Secretary to the Government of Bengal in the Public Works Department, and Assistant Chief Engineer of the Bengal Railway Branch.

The *President.*

Where were you educated?—At Trinity College, Dublin. I served a three months' apprenticeship and took the M.L C.E. degree at Dublin University, and had almost completed my Bachelor course when I received my first appointment from the Secretary of State as the result of a competition in England in 1870. We were called "Stanley" men in those days.

Where were you posted to when you came to this country?—To the Punjab for three years. For thirteen and a half years I was engaged on Railways in the Punjab, Bombay, and Bengal.

How long have you held your present appointment?—Three years.

I believe the system of competition by which you entered the service has since been abolished?—Yes, since 1871.

There will be no more Stanley Engineers?—No.

Have you had an opportunity of working with gentlemen in the service who were appointed from Cooper's Hill?—Yes, with several of them.

And with gentlemen appointed from Rurki?—Only with the last witness (Mr. Wilcocks). I have known many others.

Which make the most efficient Engineers so far as you are able to form a judgment?—The men from Cooper's Hill.

In what respect are they superior to the Rurki men as a class?—The Rurki men I know particularly well are exceptionally good men, as I have reason to believe; but, as a class, the Cooper's Hill men have greater knowledge of the world, and are more fitted to manage men. The general impression one has in one's mind is that they are more British.

In what respect?—As a rule they have greater force of character.

As regards professional training, which of the two classes appears to be superior?—I think the curriculum of the two Colleges is pretty much the same, but from my experience of Seebpore, as an Examiner for two years of the students there, I am forced to the conclusion that the material from which they are drawn is not so good as the material from which the Cooper's Hill men are drawn. Another thing which places the Natives of this country at a great disadvantage, is the fact of their having to learn all they are taught through the medium of a foreign language.

Are there not very many technical terms used in your profession which require at least a knowledge of Latin and Greek to understand them?—I should not lay much stress on that.

Is the general education of the men who go to the Seebpore College as good as that of the Cooper's Hill men?—I have discussed the subject with a Cambridge Wrangler, and he, confirming the impression derived by me as Examiner for two years, was of opinion that the general quality of the men at starting was not the same,—that they laboured under the very serious disadvantage that they did not start fairly, as regards general education, with Englishmen.

The *President*—contd.

Have you served with any Asiatic Native Engineers?—I have heard a great deal of them, but have had only one actually serving under me; and I would not like to judge of the rest by him.

Speaking generally, do Native Engineers do their work fairly well?—I think Natives can be made good Engineers if a little more attention is paid to their general education at starting. I would have a higher Entrance Examination and give them a different course of instruction from that applied to Englishmen.

And then you think they would be equally good?—I do not think they would be as good, but I think that with tact we could get equally good work out of them as out of average Englishmen.

The Hon'ble Mr. *Quinton.*

Are you speaking now with reference to railways or public works generally?—I think that railway work may be fairly considered as typical of other work.

Do you see any reason why Natives should not be more largely employed in the Accounts branch?—I am not sufficiently acquainted with accounts to say.

Have you had any professional experience on railways?—No; my experience is confined to road construction.

Can you tell us whether a preference is given to Europeans in making appointments to the lower subordinate services?—We have not much choice in the matter. When a State Railway is constructed we are obliged to calculate for a very large staff on very short notice; and, as a rule, very few of the men in the subordinate establishment are sent out from England, and those who are sent out are largely supplemented by recruitment in the open market; and gradually, by a process of survival of the fittest, we get a good staff under us. We employ a large number of Natives in that way, but mostly as temporary men.

The *President.*

Would you have Seebpore, Rurki, and Cooper's Hill men all on the same footing as regards pay and leave rules?—No, for this reason, that I think we ought to get men at their market value, and the average Seebpore and Rurki man will be satisfied with very much lower remuneration. I do not refer to men like the last witness (Mr. Wilcocks).

The Hon'ble Mr. *Quinton.*

Would you make any difference in the pay, according as the men were domiciled Europeans and Natives of this country and Europeans recruited from home?—I have thought a great deal about that, and the conclusion I have come to is that we should satisfy the Eurasian and Anglo-Indian demands more, if we made some arrangement with

The Hon'ble Mr. *Quinton*—contd.

them such as is made in the case of the subordinate Revenue service, for employing very much larger numbers of them on smaller pay. I believe under such an arrangement we should get just the same men as we do at present for less pay.

You would have a lower and a higher service, and, as a rule, they would not rise beyond the lower service?—They would not rise as a rule; there might, however, be exceptional cases. There is a great demand at present for employment by these classes, and they consider themselves unfairly treated if we do not employ them in larger numbers. I would have a smaller and select service of Europeans, and a larger body of Native subordinates.

Would you do this in order to gratify the demands of Natives for employment, or to promote the efficiency of the service generally?—I think the efficiency of the service generally would be promoted by it for many reasons. One reason is the great dissatisfaction and discontent which we feel at our own prospects not having turned out to be anything like as good as we were led to believe they would. That state of things has lasted for several years. We were led to believe that we were entering a very much better service than the Public Works Department has turned out to be, and we have realized this too late in life to be able to do anything for ourselves.

But how would your scheme meet this difficulty?—I think that a smaller and more select service would be a better paid service. I would give the members of the smaller service more favourable pay and pension rules, and make a saving out of the cheaper and lower service.

Would you make any difference as regards promotion between the men recruited in India and the men recruited in England?—No, I think the difference in market value is quite sufficiently marked by the difference in pension.

The *President*.

What is your present salary?—Rupees 800, after sixteen and a half years; and, if promotion is normal, I shall receive another step in about three years, when my salary will be ₹950. The advertisements in the *Times*, and the circulars which I received from the India Office at the time I contemplated entering the service, led me to believe that my prospects would be very much better. I was told that the average period passed in each grade was two and a half years.

To what do you attribute the slowness of promotion?—To this, that a very large number of men were brought into the Department over our heads.

From what service?—Wherever they could be picked up.

Were they Military or Civil Engineers?—Civil Engineers picked up in the London market and out here. They wanted the men; and, instead of giving them a five years' agreement and paying them so much a month, as they do now, they brought them into the regular department.

Have you any other grievance?—Yes, at the end of twenty years' service my pension will be ₹4,000, and I am desirous that it should be paid in sterling.

Do you think the grievances which you have mentioned will have a deteriorating effect on the

The *President*—contd.

recruitment in England?—I do not think so; because at the time of life a boy enters Cooper's Hill he is too young to estimate the importance of the matter and his father is anxious to get him off his hands.

Do you think it necessary that the Head Storekeeper on the Railway should always be an Englishman?—I do not wish to say anything offensive about Natives, but I must say that if I had a large store with large quantities of materials in it and a European Storekeeper could be got for the same pay, I should prefer to have him. At the same time I have always had Native cashiers under me and have never had reason to be dissatisfied with them in any way.

Do you think a Native could properly be placed at the head of the Traffic Department?—The chief Traffic officer on the Railway is in such intimate general relations, social and otherwise, with the Manager, who is a gentleman, and with the general public, and the post is one which requires the exercise of so much tact and discretion, that I think, as a rule, the Traffic Superintendent ought to be a European.

Might you not get a very well educated Native for the post?—Yes. I do not wish to say anything against Natives as a class. I am desirous of seeing them raised to the standard which is necessary to fit them to hold the best places in the Department; and I am quite confident we shall be able to do this if the Public Works and the Education Departments go hand in hand and are assisted by the best Natives.

Do you happen to know of any Native Engineers who are giving special satisfaction in Railway construction?—I know two; they are now with Colonel Walker on the Behar line. One of them has, I think, a seventeen miles subdivision of railway in construction, including one large bridge and several smaller ones, and has eight or ten thousand men employed under him; and the Engineer-in-Chief reports of him, and of another man also, that he would just as soon have their services as those of a young Cooper's Hill man of the same stamp.

Where were these men educated?—At Seebpore. I should mention that they are temporary men and liable to dismissal on two months' notice. They get ₹250 each. The other man I know is in charge of a neighbouring section; he is not quite so good, but he is a good man all round. He has about the same area of ground under him.

Are they Mahomedans or Hindus?—Both are Hindus. They have an Executive Engineer over them. I should like, with reference to the evidence of Mr. Braddon, to say that I have personally known a Native on ₹120 a month behave, on the occasion of a cholera scare, as well as any European, and stick to his post till he died; and another, the Native Engineer I have just alluded to, behaved equally well in Dinagepore on a similar occasion.

The Hon'ble Colonel *Trevor*.

I believe you have lately been making a special study of technical education in England?—Yes. In consequence of the dissatisfaction I felt with the results shown by the answers given to papers set by me when I was Examiner, I thought it necessary to

India.

P. W. Department.

Section III.

F. J. E. Spring, Esq.

The Hon'ble Colonel *Trevor*—contd.

call the attention of Colonel Trevor, as President of the Faculty of Civil Engineering, to the subject. My conclusions having been disputed, I was led to go further into the subject; and, after studying the question, I have published a pamphlet on technical education in India, and my views summarised are as follow :—

Experience having proved that our existing system of primary, secondary, and higher education has resulted in an excessive supply of more or less skilled literary labour for which there is an incommensurate demand, we are driven to look around for some other system which, while equally efficacious for the training and development of the intellects of our students, shall be a more fitting preparation for the struggle for a livelihood which we know that they will have to face.

Besides this difficulty, which has arisen from the extremely rapid development of our literary educational system, we are met by a more serious and practical danger, the gradual extinction, namely, of many of our indigenous industries and the relegation of our hereditary artisan classes to the ranks of the agriculturists. This latter difficulty has arisen from the very rapid development of industrial progress in other countries with which we in India, owing to various causes, have not been able to keep pace.

The experience of the foremost industrial nations in the ranks of which it is India's ambition to stand, is that when threatened with the loss of their industries the key to the solution of this and other economic and social problems is to be found in the wide extension of facilities for the better technical education of the industrial classes. I have no space here to refer to the numerous authorities upon whose testimony we must rely for the truth of this proposition; much evidence is to be found in the blue books and official publications of European and American States, and a perusal of these documents clearly shows that increased commercial prosperity has usually followed the application of this remedy to the decaying industries of a country.

A perusal of the import and export statistics clearly shows that we import an immense value of manufactured goods which, with our Native manual skill and great natural resources, we ought to be able to produce for ourselves. What is even a greater anomaly is that large quantities of our agricultural and other raw produce leaves our ports to return from Europe in the form of manufactured articles, which might well have been made in this country. The result of this state of things is that a large proportion of the produce of the labour of our people is lost to the producer in the form of the cost of manufacture in Europe and of freight across the sea.

Viewing this state of affairs, as I conceive we are bound to do, from the standpoint of an enlightened Native of India who has the best interests of the country at heart, and not from that of an English manufacturer or shipowner, we can hardly fail to come to the conclusion that the time has come for us to put forth a determined effort to divert the energies of a percentage of our literary classes into other and more practical channels, and to aid our industrial and agricultural classes by every means in our power in their efforts to compete successfully in at all events their own local markets with the same classes of other countries.

The Hon'ble Colonel *Trevor*—contd.

Were the financial outlook as satisfactory as might be desired, the problem would be easily solved by the rapid extension of technical schools throughout India upon the models of those which, under corresponding conditions, have been found to be successful in Europe and America. This, however, means immediate and heavy expenditure which it is not now possible to incur, and we are consequently driven to enquire how our existing educational institutions can be pruned and altered, so that without detriment to a proper supply of facilities for the acquisition by certain classes of literary culture, our industrial classes may be offered greater opportunities than they at present possess for improving their latent artistic and technical skill.

In drawing up any scheme for the extension of industrial education throughout India, we must be careful not to blindly apply European systems and methods without due regard to our very different local conditions. After a careful study of Indian conditions and of such information as I could gain from books regarding the educational systems of other countries, I have come to the following conclusions, which I desire to offer to the Commission :—

1st.—For financial reasons it will probably, for some years to come, be found to be impracticable to extend technical education without a corresponding curtailment of the facilities which the people of this country already enjoy for access to literary instruction.

2nd.—Such being the case, it is advisable to avoid too sudden or radical an alteration of the whole fabric of the existing system; industrial education must, therefore, be gradually introduced, in the light of full knowledge of the very varying requirements of different localities and industries. It should be introduced by the extension in some directions, and the pruning in others, of the courses of existing schools and colleges of all classes, rather than by the institution all over India of new schools and colleges.

3rd.—Through the medium of the elementary text-books of primary schools much information about farming and veterinary principles may, in my opinion, be easily diffused amongst the agricultural classes all over India.

4th.—In certain districts, where a hereditary caste system of handicrafts is non-existent, *bonâ fide* trade schools may advantageously be established for instruction in actual manual trades. These cases will be comparatively rare.

5th.—At centres of *bonâ fide* European industry, such as the numerous great railway centres throughout the country, more attention might advantageously be given by the educational department to the formation of classes in the existing schools for teaching drawing and such other branches of

The Hon'ble Colonel *Trevor*—contd.

practical instruction as are likly to be useful to the annually growing class of operatives.

6th.—At centres of indigenous industries which fail to compete with similar European productions, owing to Indian lack of technical skill, and which are consequently in danger of dying out, technical schools might well be established for short periods for the training of selected craftsmen in improved methods.

7th.—Facilities might advantageously be multiplied for teaching simple land surveying and valuation to men of the class of village Patwaris and Amins.

8th.—Higher schools, in the form perhaps of a development of existing "Institutes," might, in some cases, be established at our great industrial centres for the better training of foremen and managers of industries.

9th.—If any scheme for the wider extension of technical education throughout India is to be successful, we must arrange for the establishment of normal schools for the training of a sufficient and efficient supply of teachers.

10th.—If we are to look forward, as I think we must do, to being obliged in the near future to employ greater number of Natives of India as Engineers in the Public Works Department, we must endeavour to improve our existing Colleges of Engineering in the direction of their better adaptation to the raw material from which their students are derived. I am of opinion that they have hitherto too blindly followed European models without sufficient consideration of the widely different initial training and early surroundings of the Native student.

I desire to add the following remarks to my evidence upon the employment of a larger number of Natives of India in the place of a proportion of our English Executive establishment.

Much of the work which is done by the Public Works Department is of an extremely simple and elementary character, requiring less the exercise of Engineering skill than the exhibition of talents for the management and organisation of labour, the collection of material, and the keeping of accounts.

The Hon'ble Colonel *Trevor*—contd.

My experience is that Natives are frequently found to possess a high degree of talent of this description, and we might, I think, as we have largely done in Bengal, relegate much of our simpler public works, such as the construction, maintenance and repair of ordinary roads and buildings, to the graduates of our local Engineering Colleges.

There is too great a tendency in the Public Works Department to consider all men as cast in one mould, and to expect each individual to be able, at a moment's notice, to do anything, no matter what his special experience may be, and to go anywhere, without regard to racial, educational, physical or social considerations. We know as a fact that Natives of some parts of India, especially the educated classes, have the strongest antipathy to leaving all family connections and associations and going to places which they look upon quite as much foreign territory as India appears to an Englishman. The wise administrator will utilise this characteristic of the race to the advantage of efficiency and economy by securing local men for local service in larger numbers at a lower rate of pay.

We know from experience that there is not the same social difference between the Natives who come into the Engineer and Overseer classes of the Department that there is between Europeans in these classes, and that a Native who fails to secure an appointment in the officers' grades of the Department after securing his University degrees, is only too glad to accept a very much lower scale of salary and social status in the subordinate ranks of the service.

When placing highly-trained Englishmen in charge of petty road repairs, we are cutting whetstones with razors; such work might be done perfectly well by Natives of India, and if this is admitted, we are, I think, bound to employ them more largely.

The sincerest friend of the educated Native cannot, however, shut his eyes to the fact that except in very exceptional cases, he is as yet, and probably for another generation or two will be, largely lacking in those qualities of courage, self-reliance, strength of character to resist the influence of his associates, and other characteristics upon the possession of which we have for centuries prided ourselves in the Western world. For the higher appointments requiring administrative ability and conscientious integrity we must continue to principally employ Europeans. A quarter of a century of the influence of an alien system of literary education is too short a period for the radical alteration of characteristics which the influences of centuries have impressed upon a race.

WITNESS No. X.—*28th March 1887.*

Examination of LALA RALLA RAM, Honorary Assistant Examiner.

Lala Ralla Ram.

The *President.*

I am a Native of the Punjab. My family resided in the Hoshiarpur District. I was educated in the Jallunder Mission School, and afterwards at the Lahore College. I entered the Government service in 1868 as a clerk in the Public Works Account Office on ₹40 a month. I have remained continuously in the Department, and now enjoying a

The *President*—contd.

salary of ₹370. The pay of the grade varies between ₹350 and ₹450. I am now an Honorary Assistant Examiner. I am required to do subordinate as well as supervisional work in this respect. I differ from the ordinary Assistant Examiner, in that I may be compelled to do subordinate work only.

India.

P. W. Department.

Section III.

Lala Ralla Ram.

The *President*—contd.

I beg to suggest that appointments in the upper Accounts service, Public Works Department Branch, should be thrown open to competition among members of the lower service and outsiders of sufficient educational qualifications.

What is called competition has indeed been already introduced for the recruitment of the appointments to the upper branch of the service, but it is not in fact open competition. I have no doubt of the purity of the motives of the Government or the officer that recommends to the Crown the appointment of members to their servants, but the machinery for selection does not always work as satisfactorily as the intentions of the selectors are honest. The best man is not chosen because he is not known, and the persons nominated may be altogether unfit.

The *President*—contd.

As to the system of honorary rank, it was suspected when first introduced that it was intended to choke off the demands of the subordinate servants for appointment to the superior grade and in the Engineering branch. I think the suspicion has been justified. It has not, however, been justified in the case of the Accounts branch. If the subordinates in the Engineering department are considered fit for rank, they should be considered qualified for the duties of the office.

I do not think the honorary rank conferred on Natives enhances their dignity.

The Hon'ble Maulvi *Abdul Jubbar.*

I think the State must get the best men it can, and on the cheapest terms; therefore I would not nominate any of the less educated or backward races.

WITNESS No. XI.—*29th March 1887.*

C. W. Odling, Esq.

Examination of C. W. ODLING, ESQ., M.E., Superintending Engineer, Irrigation Branch.

The *President.*

You are an Executive Engineer of the first grade, and Officiating Superintending Engineer?—Yes.

Where did you receive your technical training?—At Queen's College, Galway, and afterwards with a member of the Institution of Civil Engineers named Roberts, who is now on the Drainage Commission in Ireland. I served my articles with him.

When did you come to this country?—In December 1865.

You are a Stanley Engineer?—Yes.

You obtained your appointment by competition in England?—Yes.

Since you came to India, in what department of the Public Works have you been employed?—I have been engaged principally in irrigation, and to some extent in roads and bridges.

Have you had under you Engineers who were educated at Cooper's Hill?—I have several under me now.

Have you any men under you who received their technical training at Rurki?—Yes.

Comparing the two classes, which do you consider the better educated technically?—On the whole, I consider the Cooper's Hill men superior. As a class their general education is very much better and it reacts on the technical education.

Do you consider that the Rurki College gives a technical education sufficient for the requirements of Engineers in India?—I know nothing about Rurki.

But judging from the results?—I think it turns out very fair men.

But you consider that in general education they are inferior to the Cooper's Hill men?—Undoubtedly.

Have you any Asiatic Native Civil Engineers under you?—I have at the present moment no Native in the Engineer Establishment. The Rurki Engineers who are serving under me are the Eurasians and Europeans born in this country.

The *President*—contd.

What irrigation works have you charge of now?—The Sone and the Sarun canals and river embankments.

Do the Rurki Engineers possess a greater knowledge of irrigation than the Cooper's Hill men?—At the present moment the Cooper's Hill men are a great deal the best, inasmuch as they are the only men who have subdivisional experience. I have, however, one Rurki man who is as good as the Cooper's Hill men, but it so happens that I have revenue work also, and the present men are trained in the subdivision. By revenue work I mean that we assess the water rates every year.

Do you find that Cooper's Hill men quickly pick up sufficient knowledge to undertake that duty?—I find that they pick it up reasonably quickly. They take a great interest in it.

Do you consider that the leave and pension rules are fair for Engineers of all classes in your department?—There is one point that strikes me, and that is, that some men serve a short time for a pension and others for a very long time. Without going into the amount of pension, I think the amount of service which would entitle a man to a pension ought to be the same for all. As regards furlough, I should say that men appointed out here and domiciled here require less furlough than men do whose domicile is in England.

Do not the present furlough rules for men appointed in this country allow only two years' leave in the whole period of their service?—Practically they get five years, two years' sick leave and three years' furlough. Practically their furlough rules are more favourable than ours, because sick leave with them in no way prevents them getting furlough. There are advantages on either side.

The Hon'ble Mr. *Quinton.*

Under the local self-government scheme is every District Board furnished with its own Engineer?—Each District Board has its Road-cess Engineer in addition to the Provincial Establishment.

Are they Native Engineers chiefly or Europeans?—In Behar they are mostly Europeans.

The Hon'ble Mr. *Quinton*—contd.

Are the Provincial Establishments in your opinion excessive for the work that has to be done? I mean to say do the Road-cess Engineers undertake any part of the work which used to be done by the Provincial Establishment?—Yes, a great deal of it.

Is there any waste of power in that respect, owing to the fact that you have now two men to do work which was formerly done by one?—I think that possibly some roads might advantageously be transferred to the Road-cess; as regards buildings I feel less able to speak, and with regard to the Arrah district, of which I have special experience, I think nothing could be gained by giving over the buildings in that district to the Road-cess Engineer. I do not think that, except in one small station perhaps, anything could be gained by it, and probably a good deal would be lost.

Do the Executive Engineers look after the canals also?—The Executive Engineers under me have the maintenance of the canals as well as of buildings.

The *President*.

Who looks after the bridges?—I have charge of one or two bridges; but, as a rule, the bridges are under the Road-cess Department.

Are Road-cess Engineers competent as a class to take charge of important bridges?—The men who are appointed in Behar are men on high pay, and, I think, competent men.

To look after bridges over considerable rivers?—I should say so, more especially as they are very closely supervised by the Divisional Superintendent, who is a Government officer and lives at Bankipore and does nothing else. Moreover, a large bridge must always go up to the Secretariat.

The Hon'ble Mr. *Quinton*.

With reference chiefly to roads and bridges, what proportion of the total allotment for works in your division is given to original works, and what to establishments?—There has been a great difficulty in this respect in my circle. Hitherto the Road-cess and buildings committees have taken all responsibility for establishment, and charge 20 per cent. on irrigation works. I believe the arrangement has not been exactly satisfactory as regards roads and buildings, and I believe also that from this year forward we are going to take over responsibility for them.

Can you tell me how much of your expenditure is on original works and how much on repairs?—My chief work is really to look after my irrigation. I have about 35,000 acres of irrigation under me, and the revenue from that has to be collected. I think last year we collected ten lakhs of rupees, and certainly three-fourths of our expenditure was on repairs. For instance, I am repairing the Sone weir now, and I should say the work was of a much more difficult nature than the original building. On roads and buildings I only spend a lakh of rupees a year.

How much do you spend on original works?—This year I should think that the expenditure on original works in proportion to that on repairs is five to four.

Is not a large proportion of your grant for roads and buildings spent on repairs?—This year I

The Hon'ble Mr. *Quinton*—contd.

should say the original works will be more expensive than the repairs.

Are there any important original works in operation?—Yes, I have had two original works of some size to do very quickly indeed.

The *President*.

How are the Road-cess Engineers selected?—Under the system which has hitherto obtained the Road-cess Engineers have been selected by the Local Boards from persons nominated by the Public Works Department of the Local Government and approved of by the Lieutenant-Governor. The Act under which these appointments were made is about to expire. Under the new Act the Local Boards will have greater liberty of selection,—a liberty which will be controlled only by the rules framed under the Local Self-Government Act, which merely prescribe the qualifications requisite in officers to be appointed, and leave the Local Boards at liberty to select whom they please out of persons possessing those qualifications.

The Hon'ble Mr. *Quinton*.

How many Road-cess Engineers are there in your circle?—There are seven, and with one exception, I am personally acquainted with them all.

And how many Executive Engineers are there?—I have four Executive Engineers in charge of subdivisions; a considerable number of my subdivisional officers are Executive Engineers in point of rank.

The Hon'ble *Maulvi Abdul Jubbar*.

Have you any Native Engineers under you?—I have got one Native subordinate who is doing the work of an Engineer, and doing it pretty well.

Is he from Bengal or Behar?—He is a Bengali. He was brought up in the Seebpore College.

I believe most of your Overseers are Natives?—Yes.

How do they work?—Some of them work very well and some of them very badly. There are of all sorts amongst them. A great number of one kind or the other.

Had they a systematic training?—Yes.

Before appointment?—Yes, but their success depends on their activity and energy, qualities which are quite independent of technical training.

Have you any Mahomedans among your Native subordinates?—I have some, but not among the upper subordinates at the present moment. I have several Mahomedan Sub-Overseers of all kinds. Some of them are doing very well. Under orders of Government I have lately been trying to introduce a certain proportion of Mahomedans.

The *President*.

You have no objection to employing Natives of any creed?—None whatever, provided they are efficient.

What has hitherto been your difficulty in employing them as subordinates?—I have hardly any but Native subordinates. I have very few European subordinates.

India.
P. W. Department.
Section III.
C. W. Odling, Esq.

The *President*—contd.

Have you ever refused to employ any Native on any other than the ground of unfitness?—As a rule, I prefer to have Natives as subordinates. You probably get better men amongst Natives for low pay than amongst Europeans, except for mechanics. For mechanics I find Europeans the best and am obliged to employ them.

Have you any Royal Engineers under you?—Not at the present moment; I have had.

Comparing Cooper's Hill men with the Royal Engineers, which are the more efficient officers?—They are all very much alike. I think the only objection to the Cooper's Hill men is that, having all been trained in one institution, they have to a large extent one way of looking at things.

The Hon'ble Mr. *Quinton.*

Have you noticed whether the Natives under you, as they get on in years, lose mental and physical activity to a greater extent than Europeans do?—Most assuredly they do. It is one of the great difficulties I have had in finding employment for Natives. I have some Native subordinates who have done excellent work, and who, as they get older and more experienced, ought to be filling more responsible situations, but who, on the contrary, wish for easier work, and I have at times considerable difficulty in withstanding this tendency.

The Hon'ble Mr. *Quinton*—contd.

Do you think the feeling is more marked with them than with Europeans?—I think it is very much more marked. Judging from my own experience, I should say that Europeans up to a certain age lose very little of their activity as they get older.

The *President.*

I suppose that as men rise in the service they have more supervisional work?—They have.

WITNESS No. XII.—*29th March 1887.*

Examination of T. DEVERIA, ESQ.

T. Deveria, Esq.

The *President.*

You are a member of the firm of Marillier and Edwards of this city?—Yes.

Your firm carries on the business of Civil Engineers?—Yes, and of Contractors both in Calcutta and throughout India.

Have you any Civil Engineers in your employment?—We have one. He is a European. We brought him out from Scotland. I believe he served his articles with a Civil Engineer in Glasgow.

In the execution of public works you have been brought in contact with Engineers of all classes in India?—Yes.

Have you executed many large and important public works?—The most important work our firm has had charge of was the Dacca Lock gates. That was a heavy contract.

Have you had contracts for less onerous works?—Yes, for a good deal of iron work. Most of the iron work of this building was done by us.

Have you formed any opinion of the relative merits of the different classes of Engineers with whom you have had to do? Have you known any Engineer from Cooper's Hill?—In the course of business I have been brought in contact with Engineers of all kinds except Rurki Engineers. I have not met any Rurki Engineers to my knowledge.

Have you had to do with Royal Engineers?—Yes.

Do you consider that the different classes of Engineers with whom you have come in contact were all equally efficient as Engineers?—Yes.

Have you known any Native Civil Engineers?—I do not think I have.

What is the highest position in the works department of your business in which you employ a Native?—As a rule we do not employ Natives, because we find Europeans are more reliable and, as a rule, better suited for the work we have to do.

The *President*—contd.

What is the highest salary which you pay a Native employé in your works department?—We have given as much as ₹150.

What do you pay your Engineer from Scotland? ₹400 a month.

What is the next highest salary paid by you to a European?—The salaries paid to the employés in our yard range from ₹300 to ₹450. We have a Foreman Smith, a Foreman Carpenter, a Foreman Moulder; and all of them were brought out from Scotland.

What was the position of the Native to whom you paid ₹150—I used to put him to do odd jobs. I employed him as a kind of Overseer to carry out some works that we executed for the Port Commissioners—some jetties we were constructing for them.

Was he a builder?—He was acquainted with masonry.

Was he an efficient man?—Yes. He is now in my drawing office.

Was he educated at any of the Engineering Colleges here?—No; he has had no special education; he is a practical man.

Is there any considerable number of Natives in Calcutta who are qualified to supervise such work as you require to be done?—Yes, there are the subordinate hands in the Public Works Department.

Why then do you bring out men from Scotland?—Because we cannot get competent Natives for the kind of work we employ Europeans upon.

Are there any large workshops in Calcutta where Natives are largely employed?—They are always employed but under supervision.

Do you find that a Native mechanic is equal to an English mechanic?—He is a very good workman.

What do you pay your best Native mechanics?—We pay them as high as ₹40 to ₹50.

The *President*—contd.

They are all skilled artisans?—Yes.

Who supervise the skilled artisans?—Europeans.

Are these skilled artisans men who could make a drawing of an engine, or put an engine together?—They could not make a drawing of an engine, but they might put one together.

If you asked one to make certain alterations in the details of an engine, could he do it?—If you showed him what you wanted he would be able to do it.

He could not make a drawing by himself?—No, because he has not been brought up to it; but those who have learnt drawing and have learnt machinery could.

Have you any Native of that class in your employment?—No.

The *President*—contd.

Have you been over the Seebpore College?—I went over it once.

Did you make yourself acquainted with the course of studies pursued there?—No.

Are you acquainted with several other European firms in Calcutta doing business somewhat similar to yours?—I know some of them.

Do they employ European superintendence?—As a rule they do. Natives have not the opportunity for obtaining instruction, or they might do quite as well as Europeans. They are very good workmen so far as manipulation goes. The only drawback is that they do not use their brains as they might. They require to be shown what to do.

Are they equal to doing work on an emergency?—No; if you stand at their back they will not work so well. You must leave them to themselves. If you hurry them they cannot do the work.

WITNESS No. XIII.—*29th March 1887.*

Examination of A. W. RENDELL, ESQ., Locomotive Superintendent, Eastern Bengal State Railway. *A. W. Rendell, Esq.*

The *President.*

Where did you receive your technical education?—In England. I was trained on the Brighton Railway. I think I paid a premium of £150. The premiums now paid are higher; they range from £300 to £500.

How long did you receive instruction on the Brighton Railway?—I was on the Brighton Railway eight years altogether.

How many years were you serving under articles?—My articles expired because the Superintendent to whom I was articled left his appointment; but the succeeding Superintendent took me on his staff and paid me.

In what year did you come to India?—In 1874. I came out to join the East Indian Railway. I was engaged by the Company. In 1877 I obtained an appointment in the State Railway.

When you were learning your business, had you charge of an engine pit?—Oh no. I began as a Driller and worked on the lathe at piece-work for some time, and then I went on to the benches as a Fitter. After two years in that position I was transferred to the drawing office as Head Draftsman, and after about a year and a half there I was sent down to the shop as an Assistant Foreman.

What work were you employed on there?—Getting work through as fast as I could. I was constantly employed in the building of engines. I had to superintend the putting together and repairing of engines. Our shops were partly for construction and partly for repairs.

Is it necessary, in order to make a thoroughly competent Engineer for the locomotive department of a railway, that a man should have undergone a training in the railway shops?—Quite.

In dealing with engines, is extreme nicety of manipulation required?—The very best.

What did you become next?—I was sent down as Fireman on board the steamers at Newhaven.

The *President*—contd.

So that you became acquainted with the details of marine engines?—Yes. Afterwards I was for a short time employed as Inspector under Government to inspect work which was coming out to India.

You are now Superintendent of the Locomotive Department?—Yes.

And you have several assistants under you?—Yes.

Are they all Englishmen?—Yes. In my department, excepting the Accountant, there is no Asiatic Native among the supervising officers. All the officers under me who have supervisional functions were born and trained in England.

Then you have no experience of Natives as Mechanical Engineers?—No; I have never met a Native Mechanical Engineer. Of course I have numbers of Native mechanics, but not supervising mechanics.

Have you met any Eurasian or European Mechanical Engineer who received his technical training in this country?—Yes.

Where had they been trained?—Principally in our own shops.

Do you know whether they had received any of their technical training in any of the local Engineering Colleges?—I have never had under me, except in junior positions, any men who had been so trained.

As Mechanical Engineers, what do you think of men who are trained in this country?—They are fairly efficient, but they have not the accuracy and the method that the man has who has been trained at home; and they have not the scope for acquiring it. They do not see such good work out here as men do at home.

What is the highest salary that a Native mechanic earns under you?—I think the highest salary is about ₹100.

What appointment is that?—That of Head Mistry.

India.

P. W. Department.

Section III.

Babu K. P. Mukerji.

The Hon'ble Colonel *Trevor*—contd.

ing, passed students of Seebpore, who have had some practical experience in the Public Works Department, and have been well reported on, and who are without employment; such men are occasionally willing to take appointments as subordinates.

Would men like that be fit for promotion to the upper grades?—After a few years' practical work as subordinates they would be fit for promotion to the higher grades; and the general efficiency of the service would be improved by their presence there.

Do you suggest that the members of the Engineers' grades should all have gone through the subordinate grades in that way?—No, because then there would be no distinction of services. There are already two grades, the subordinate and the Engineers'; and I think the arrangement ought to be maintained.

You have spoken as if the Public Works Department should be kept, as it were, as a big school for the education of Engineers; but if, as you say, there are men now in the market who have been trained at college and proved in actual service, and who are anxious to pick up any work they can, why should not Engineering become a private enterprise?—Engineering unfortunately requires an expenditure of capital, and these men have no capital.

The Hon'ble Colonel *Trevor*—contd.

Cannot they get employment in large firms?—There are very few openings of that kind in India.

The *President*.

May we take it that large works in this country are carried out either by Government or by foreign firms?—Yes.

And that these foreign companies prefer to employ foreign labour when they require Engineers?—Yes; because they themselves are Engineers and come here with their own capital and their own staff.

The Hon'ble Colonel *Trevor*.

If you have to repair a kutcherry you must get a contractor to do it; and he is not a large contractor, is he?—No. Contractors for kutcherries are generally small Native contractors.

Are there not numbers and numbers of them?—Yes.

Why should they not employ Native Engineers to supervise their works?—Because they have already a Government Engineer to do so.

WITNESS No. XV.—*29th March 1887.*

J. H. Toogood, Esq.

Examination of J. H. TOOGOOD, ESQ., 2nd grade Executive Engineer, Public Works Department.

The *President*.

Where did you receive your technical education?—Partly in King's College, London, and partly in the Calcutta College, I was born in India. My father was in the Government service here for about twenty-five years. I received my general education entirely in England. I applied for employment in the Public Works Department, and was told I should have to pass the examinations prescribed by the Code, and to prepare myself for them. I then joined the Calcutta College. I entered the service in 1871 as Apprentice Engineer. I remained for thirteen months in the third grade and six years in the second grade, and after a few months in the first grade I became in 1880 fourth grade Executive Engineer. I am now a temporary second grade Executive Engineer in charge of the workshops at the Seebpore College.

Are there two classes in the College, one for Mechanical and the other for Civil Engineers?—There used to be a Civil and a Mechanical class, but that has been done away. There is, now only one superior class, the Civil Engineers' and there is an Apprentice class.

Do you consider that the course of study at Seebpore is sufficient to make a man a competent Civil Engineer?—To a great extent, for ordinary works, it is; but the students there have not the opportunities of seeing works which men in England get.

Is the workshop over which you preside fairly complete in machinery?—Yes, it is very complete in machinery.

The *President*—contd.

So as to exhibit all ordinary operations?—Yes, all which are required in foundry work. We can cast up to two tons. In my department all the foundry, fitting, and carpentry work required for the Public Works Department is done.

Who supervises the different branches of the work in your workshop; for instance, who supervises the carpentry?—We have a Foreman. He was trained in the school at Dehra.

Is he equal to a European Carpenter?—I should say not. I think he is a Eurasian; he may be a European. He is better trained theoretically than a Master Carpenter, but is not better practically.

Have you any European supervision in your workshop?—The Foreman Fitter is a European. He was trained in England. All the other men subordinate to him were trained in this country.

What is the course of study which the pupils go through in these shops?—In the Apprentice class during the first three and a half years, they have a year in each of the shops and six years in the foundry. They attend from eight till eleven in the morning.

Do you go round the shops with them and point out any defects you may observe, or any excellence that is to be attained?—Yes. At the end of these three and a half years they have eighteen months in whichever one of the shops they may select. They work there for six hours a day, from eight to one and three till four.

The *President*—contd.

Is any educational qualification required of boys who present themselves for admission to the classes?—They have to pass in English and Arithmetic.

After they have completed their eighteen months in the shop they select, what becomes of them?—Some of them get employment in the Public Works Department and others in private firms.

The Hon'ble Mr. *Quinton.*

What age are they when they enter the shop?—Varying from fifteen to seventeen.

Are the applications for admission numerous?—I believe not. They do not come to me.

How many boys are there in the Engineer Class?—About fifty; perhaps not so many.

The Hon'ble Colonel *Trevor.*

I believe the Overseer class is more popular than the Engineer class?—Yes; it is less expensive. The European pupils in the Overseer class pay ₹5 a month and the Natives ₹2.

Do they readily get employment after they have left the College?—I am told that it is very difficult to get any information on the subject. There are not many of them employed; some of them get into the Public Works Department.

The Hon'ble Mr. *Quinton.*

How many are there in the Engineer class?—I cannot exactly say. There are fifty at all events. In this class the European pupils pay ₹360 per annum and the Natives ₹180. A higher charge is made for house-rent and board for Europeans than for Natives.

Do they all have the same accommodation?—Some of the Natives will soon get similar quarters; some do now.

Do the pupils in the Engineering class readily find employment after they leave the College?—The only men who do are those who find employment in the Public Works Department. The Government guarantees to each of the Colleges alternately one or two appointments a year. I do not know what becomes of the rest of the men. Hitherto it has been customary, when applications are made by Local Boards for the services of Engineers, to name such of the pupils of this institution as are considered competent for the work.

The Hon'ble Mr. *Quinton*—contd.

The *President.*

In the Apprentice class are the men sufficiently well trained to become Superintendents in the Locomotive shop?—I think some of them would be. Some of them are very sharp, but generally the sharp ones are either Europeans or Eurasians.

Why?—Because they are more observant.

Have you any Mahomedans in either class?—No. I do not think there is any Mahomedan in the College.

In the Civil Engineers' class are the Bengalis, the Europeans, or the Eurasians most numerous?—There are fewer Europeans and Eurasians in the upper class than Bengalis, but the few Europeans generally take the highest places and obtain the appointments. In one year I passed out seven successful candidates, five of whom were Europeans and Eurasians; three out of the seven had received their education in England.

Have you anything further to say?—Yes, I desire to make a few observations on the position of the Subordinate grades of the Public Works Department. Promotion in those grades is very slow now. Some men after serving fifteen or sixteen years are simply first-grade Overseers.

I think that the Bengal College could supply a highly qualified set of men who would be willing to join the subordinate service if allowed to do so on progressive pay instead of having to trust to the accidents of promotion.

You would in exceptional cases promote the best men of the upper subordinate service to the Engineer department?—Yes; I think you would get a better qualified set of subordinates by holding out a prospect of promotion to the Engineer establishment.

WITNESS No. XVI.—*5th April 1887.*

Examination of BABU KHETRA NATH BHATTACHARJEA.

The *President.*

I was educated at the Calcutta Engineering College. I was formerly in the Public Works Department. I was at one time Officiating Executive Engineer, and when I became Assistant again I resigned my appointment. For some time I was employed as Road-cess Engineer; afterwards, for a few months, I was in the service of the Maharajah of Kashmir, and have since practised on my own account.

I consider the manner in which the Engineer establishment of the Public Works Department is recruited is, in the first place, unnecessarily expensive, and, in the next place, unfair to the Natives of India. By Natives I mean those who own the soil, whether they be domiciled Europeans, Hindus, or Mahomedans. I also consider the administration is unwieldy; that in fact each administration should be allowed to manage his own public works; and that the Department should not be under the Government of India; but that the patronage should rest entirely in the hands of the Lieutenant-Governor.

The *President*—contd.

I do not object to the employment of the Royal Engineer Corps. I recognise the necessity for this as a matter of military training. But the great evil of which I complain is the Cooper's Hill College. The first batch of students was turned out of that institution in 1873, and from 1873-84, 297 Cooper's Hill men were appointed to the Bengal Presidency alone, and not a single student from the Bengal College, which is now called the Seebpore College. Yet during those 12 years no less than 68 students completed their course at the Seebpore College and obtained either the degree of B.C.E. or the certificate of L.C.E.

India.

P. W. Department.

Section III.

Babu K. N. Bhattacharjea.

The *President*—contd.

Out of the 298 Cooper's Hill students, there are at present in the territories under the Lieutenant-Governor of Bengal 40 drawing pay from ₹350 to ₹800 per mensem, while 68 successful students of the Bengal College have obtained inferior appointments or appointments under *quasi*-public bodies, and the other half are without employment altogether. I know some of these young men personally, and know them to be generally well educated and well instructed in professional knowledge. The Engineering College should be removed from the Department of Education and placed under the Chief Engineer to the Government of Bengal. The cost of a Cooper's Hill College student is annually between ₹3,500 and ₹4,000, at the rate of ₹13 per pound sterling; the cost of the Bengal College student is ₹60, more or less.

I have heard that a great deal has been made of the circumstances that the European firms in Calcutta do not employ Native Engineers. I am informed that Natives are engaged but only for the lower appointments; for the higher, the directors and partners in England make appointments from their own *protéges*. European firms have mostly to deal with European clients, and if these

The *President*—contd.

firms employed Native Managers they would run the risk of dissatisfying these clients.

I would admit to the Seebpore College such students only as have passed the First Arts Examination, and have, moreover, studied for one year in the literature classes of the third year of the University course. As to Cooper's Hill College, I do not know whether there has been any change of system recently which has relieved the Government of India of expenditure. I understand that interest is paid on a large sum taken up for building and for supplying the College with plant, machinery, and so forth. I wish also to say that in this country the unit is the Public Works Department, and that I would place the works under the Collector. I would abolish the running about over the country of so many supervising authorities, one for Civil works, one for Military.

I am of opinion that the Seebpore and Rurki Colleges turn out men competent to undertake any work in this country. I have not taken into account in calculating the cost of students to Government the allowances granted during training. I have taken account of the cost of Seebpore and I estimate it at 5 lakhs, at 4 per cent.

WITNESS No. XVII.—*29th March 1887.*

Babu K. M. Bose.

Examination of BABU KHETTER MOHUN BOSE, Executive Engineer, now Pensioner.

The *President.*

I desire to make some observations on this department of the Sub-Committee's enquiry.

All first appointments to the Engineer grade are made by the Secretary of State and the India Government—

1. From Royal Engineers.

2. From passed students of the Cooper's Hill College.

3. From passed students of the Thomason and Seebpore Civil Engineering College.

From the information I have, it appears that, between the years 1872 and 1884, 297 candidates were appointed from the Cooper's Hill College, or an average of 23 annually, while during that period the Seebpore College turned out 68 students, some of whom got temporary appointments, and were discharged after meritorious service.

According to recent ruling, 1½ students from Seebpore and 4½ from the Thomason College are guaranteed appointments yearly. But even then, the mode of recruitment, chiefly from the Cooper's Hill College, is not only extravagant, but is injurious to the development of indigenous talent.

A Cooper's Hill student costs the State almost ten times as much as the cost of training a young man in the Seebpore College. For the sake of economy, therefore, if not for anything else, the greater portion of the recruits should be drawn from the local colleges and their appointments left to the patronage of the Lieutenant-Governors of the Provinces, the Colleges being placed under the direction of the head of the local Public Works Department.

The appointments to the Account branch and to the upper subordinate establishment should

The *President*—contd.

rest with the local Governments and not with the India Government, and ought to be open to all candidates seeking employment.

In regard to promotions, I have nothing to say, except that the promotions of the superior officers of the Department should rest with the local Governments like that of Executive and Assistant Engineers.

In regard to pay, I have nothing to say: the scale of pay in this Department is not above that of other departments of the Uncovenanted Service.

Pensions should be awarded on a graduated scale and should commence after 10 years' service. Furlough should count towards pension in the case of Hindus and Mahomedans as well as of Europeans.

The course of instruction and practical training afforded by the local Civil Engineering Colleges and the workshops attached to them are quite sufficient for all requirements of the Department, supplemented, as this previous training will be, by apprenticeship on works in progress.

All classes inhabiting the country seek employment in the Department. I have not observed any special aptitude in any class, nor can I give preference to one class over another.

The existing organisation of the Department into circles, divisions, and subdivisions, each presided over by an officer in subordination to his superior, and all presided over by the Provincial Chief Engineer, is a cumbrous machinery and slow in action. But this will be so as long as repairs of roads and buildings form part of the duties of the Department. These repairs can be safely made over to the District Boards, acting under the direction of the Divisional Inspectors. In the case of original works requiring

The *President*—contd.

real professional skill and supervision, special arrangements ought to be made under the immediate orders of the Provincial Chief Engineer and Assistants, and without the intervention of any intermediate officers, as Superintending Engineers.

The India Government appoints Engineers for the Provincial Governments from the local colleges. Also upper subordinates and officers of the Accounts branch. It prescribes from time to time the numbers of officers of each grade, including upper subordinates and even Accountants, to be attached to a province. This kind of control may have been found necessary when the Department was first constituted in 1856, but at the present stage of its existence more freedom of action should be allowed to it to ensure its healthy and normal development.

The *President*—contd.

The system of check and audit now in force can be simplified to the relief of the Engineer executing works and to the promotion of economy.

The Hon'ble Mr. *Quinton.*

I resigned in 1879, when I was 3rd grade Engineer. I received a bonus and a pension.

I understood that the cost of the College at Cooper's Hill was not covered by the fees received.

I have estimated that a Seebpore student costs the Government ₹800 or ₹900, and a Cooper's Hill student ₹10,000 a year.

I consider that the Cooper's Hill estate should be disposed of.

Witness No. XVIII.—*29th March 1887.*

Babu B. C. Paramanic.

Examination of Rai Sahib Bama Churn Paramanic, Honorary Assistant Engineer.

The *President.*

I was educated in the old Calcutta Engineering College. I passed as an Assistant Engineer, Irrigation Department, and was appointed as an Overseer. I have been 23½ years in the Department.

1. Admission of candidates to the Engineer grade should be, as now, by pass certificates from the Civil Engineering Colleges of India. The training, both theoretical and practical, in these Colleges is quite sufficient for the ordinary requirements of the Department. In my opinion it is not inferior to that given at Cooper's Hill.

2. The number of annual appointments from Indian Colleges is very small, being only 8, whereas from Cooper's Hill it is 20 or so. Cooper's Hill is not necessary for the requirements of India and should be abolished. Higher administrative posts should be recruited from Royal Engineers, to whom special inducements should be given to accept Indian appointments. The Royal Engineers might be given higher rate of pay, say one-third more than the Native.

Seebpore	1½
Rurki	4½
Bombay	1
Madras	1
	8

3. More appointments should be filled from Indian Colleges. The number should be at least 25 annually, open to Statutory Natives :

Bengal	6
Bombay	4
North-Western Provinces	11
Madras	4
	25

The Forest, Survey, and Telegraph Departments should be recruited to a certain extent from passed students of Indian Colleges. If these departments be opened to them, adequate training should be given to fit them for those duties.

4. European Engineers in one sense already get higher emoluments than the Native. They get Presidency allowances, which the Native does not. His first appointment is 2nd grade Assistant Engineer on ₹350, whereas a Native is first appointed as an Apprentice Engineer on ₹100. The European's subsequent promotion is much more rapid than that of the Native. Taking all this into consideration, the European's average pay becomes much higher than that of the Native of the same standing.

The *President*—contd.

5. There are now 68 passed students of Seebpore College alone without any employment, though large number of men are annually brought from England to fill up vacancies. There is, therefore, a great deal of heartburning amongst these young men. Even outsiders other than Cooper's Hill men have been appointed in supersession of these men.

6. The Road-cess Engineers should be recruited from the Public Works Department. Government should make these appointments.

7. There was a provision in the Public Works Code for the promotion of a deserving senior upper subordinate to the grade of Assistant Engineer, but this has been discontinued in the new Code. This should be re-inserted and should be given effect to.

8. There is a Resolution of Government of India (No. 1146 G. of 23rd August 1883) providing for the promotion of deserving senior upper subordinates to temporary Executive Engineers and Assistant Engineers. This has been acted upon in Madras, but no such promotions have been made in Bengal. The provisions above referred to will have a salutary effect on the upper subordinate class if they are acted up to. At present it is a dead letter. In the case of upper subordinates who have passed as Assistant Engineers, special consideration should be shown and the benefit of this Resolution should be given them.

9. The bestowal of the honorary rank of Assistant Engineers on senior upper subordinates is well appreciated, but in the case of those who have passed the prescribed examinations for Assistant Engineer and have long and meritorious service in the Department, the substantive rank of Assistant Engineer should be given.

10. Military subordinates promoted to Honorary Assistant Engineers get the higher pay of Assistant Engineer, but in the case of civilians of the upper

India.

P. W. Department. — Section III.

The *President*—contd.

subordinates promoted to honorary rank, the increase is not given. There should not be a distinction in this respect.

Babu B. C. Paramanic.

11. India Government Resolution (No. 1432 G. of 12th December 1884) sanctioning first increment of ₹50 to 1st grade Sub-Engineers after 5 years' approved service, and a second increment of ₹50 after 10 years' service, will not benefit the future 1st grade Sub-Engineers as to be entitled to it; they will have to serve at least 35 years or 40 years as the classified list will show. Annual increments of, say, ₹20 will be preferred to these quinquennial or decennial increments. Promotion in the lower grades should be more rapid to make the attainment of this increment possible.

12. There is at present a complete block to promotion to upper subordinates. There are men who are from 15 to 20 years in one grade without any immediate or future prospect of promotion. This should be remedied by increasing the strength of the upper grades.

13. Before 1876 the privilege of being called gazetted officers was enjoyed by all members of upper subordinate establishments, from Overseers to Sub-Engineers. But since 1876 their appointments, transfers, promotions, and leave are no longer gazetted. They feel this sorely. It is an unmerited slur to a very useful class of public servants. Now even a Sub-Engineer, 1st grade, drawing ₹500 a month, cannot call himself a gazetted officer, though a Sub-Inspector of Schools and a Canongoe and a Sub-Deputy drawing ₹50 enjoy the privilege. No valid reason has yet been given for this anomaly. The saving of the cost of publishing a few notifications in the Gazette is surmised as the only reason. The notifications in the Gazette are always handy for reference, whereas in the present a service book has to be kept for each man, and in case of any reference, bundles

The *President*—contd.

containing orders concerning each man have to be hunted up, entailing unnecessary trouble and work to the Secretariat.

14. The lower subordinates are a very useful class of men. They do all the rough work of the Department, but their prospects of rise in the Department are very poor. They scarcely get any promotion. They are only sure of getting an increment of ₹5 after 5 years' service. Promotions from one grade to another have been latterly almost stopped. They begin at ₹25, and after 30 years' service they can only hope to get ₹55 or ₹60, unless the present state of things is changed. Their case requires being closely looked into. Most of these men are the junior students of the Engineering Colleges, and some of them are very good indeed. Their prospects of promotion should be brightened to attract good men. One or two of the most deserving senior men should be annually promoted to the upper subordinate grade as an incentive to others to work faithfully and honestly.

15. All the Assistant Engineers and upper and lower subordinates come from the middle class of Hindus, the class which supplies all the other services. The Mahomedans have hitherto shown no tendency to fit themselves for the higher grades of the service. There are a few who are lower subordinates, but even in this class of appointments the supply is falling off. The number of Mahomedans in the higher classes of the schools are very small, and those that succeed in passing the First Arts or the B A. generally elect the Bar, and the subordinate Executive and Judicial services, in preference to Engineering, in which the prospects for the Natives of the country are not very cheering. The fate of the passed students of the Seebpore College has, I believe, discouraged Mahomedan gentlemen from sending their sons to try Engineering.

Witness No. XIX.—*29th March 1887.*

Babu M. C. Roy. Examination of Babu Madhub Chunder Roy, 2nd grade Executive Engineer, Public Works Department.

The *President.*

Where were you educated?—In the Calcutta Engineering College. I left the College in 1862 and entered the Government service and was posted to Calcutta, and placed in charge of buildings,—namely, St. James's Church, the University, and the High Court. I was ten years in Calcutta. I became an Executive Engineer in 1872, and afterwards served at Tipperah.

Have you served with gentlemen from Cooper's Hill sufficiently near to be able to form an estimate of their work?—Yes.

And also with gentlemen who have been educated at Seebpore and Rurki?—Yes.

What is your opinion of the relative merits of these three classes?—My opinion is that the Civil Engineers educated in this country procure the execution of a work by the influence which they command over the labouring class; whereas the Engineers educated in England do the work equally well so far as technical knowledge goes, but not so much by the influence they have over the people as by compulsion. In building ordinary bridges, the Engineers educated in India are quite equal to

The *President*—contd.

those educated in England, but not in large works, as sufficient scope is not given to the Indian Engineers.

Which is the better class as regards general education?—The European Engineers as a rule.

Are there any rules in your Department respecting furlough or pension which you desire to bring to the notice of the Commision?—Yes; I think there should be a graded scale of pensions.

At what period of service should a man become pensionable?—If he became incapacitated, I would give him a proportionate pension at any time after ten years, otherwise he should be pensionable after twenty-five years. Another objection I have is that furlough is not counted as service for pension. A man requires furlough if he is to work with energy, and unless his furlough is allowed to count as service for pension he will not avail himself of it.

Do you consider that all men in the service should have the same rules?—Yes.

Have you anything further to observe as to pension?—Yes. There ought to be no difference in pension rules.

The *President*—contd.

Do you think there is any ground for the complaint which is made that promotion in the subordinate service of the Public Works Department is so slow, and that the pay has not been sufficiently raised of late years?—That promotion is slow is an acknowledged fact, but I think the pay is sufficient if the promotion were more rapid.

Would you promote the best men from the Upper Subordinate grade into the Engineer grade?—In exceptional cases.

The Hon'ble Maulvi *Abdul Jubbar.*

Do you think that the Native officers in your Department find it as easy to get leave as the European officers do?—I think it is more difficult for a Native to obtain privilege leave when he wants it. It was so in my case.

The Hon'ble Colonel *Trevor.*

You are speaking of ten years ago?—Yes.

WITNESS No. XX.—*29th March 1887.*

Babu K. N. Chatterjee.

Examination of BABU KHEDER NATH CHATTERJEE, 2nd grade Executive Engineer, Public Works Department.

The *President.*

Where did you receive your technical training?—At Rurki. I was educated at the Agra Government College. I was senior scholar there. That was before the University was established. I entered Rurki in 1858 and remained there for two years. On completing my education there I received an appointment as probationary Assistant Engineer, and after serving two years and six months in that grade was admitted an Assistant Engineer. After twelve years' service as an Assistant of various grades, I was appointed to the Engineer's grade, being posted to the Ganges Canal, and since then I have been transferred to Roads and Buildings. I have been on Roads and Buildings for about twenty years. I have served under and with Engineers of all classes—Royal, Stanley, Cooper's Hill, and Rurki and Seebpore Engineers.

Comparing the Engineers educated at Cooper's Hill with those educated at the Indian Engineering Colleges, which do you consider make the most efficient Civil Engineers?—I do not see much difference between them so far as technical knowledge is concerned.

As to their comparative energy in carrying out works?—It depends on the individual. I find that Natives can undergo greater fatigue and knock about a good deal more than Europeans can.

Do Natives show the same energy in pushing work through as Europeans do?—I think so.

The Hon'ble Maulvi *Abdul Jubbar.*

When you speak of Natives do you include Statutory Natives in the term?—No. Eurasians and Europeans domiciled in India cannot endure so much hardship as Natives can.

The *President.*

Do you recollect any instance of Eurasians or Europeans having broken down under hardships?—Yes; I recollect that, in 1873, when Lord Northbrook laid the foundation of the Nerbudda bridge the road to Kuttuck was under the charge of two Royal Engineers and a Stanley man. They were ordered to put the road in good order, but afterwards the work was taken away from them and given to Native Engineers.

Why?—Because they could not put the road in good order.

The Hon'ble Maulvi *Abdul Jubbar.*

Why?—On account of their inefficiency or of climatic difficulties. At any rate the fact was that they could not do it. They spent lots of money, but still the road was not put in good repair by them.

The *President.*

Were they wanted elsewhere?—No. They wanted to remain, and protested against Natives being sent there. The road had to be got in good order within six months, and the Natives who were put in charge had to work day and night. It was in the Nerbudda valley, a very hot place.

You say these gentlemen were removed against their will?—Yes.

The Hon'ble Colonel *Trevor.*

What are your grounds for saying they were removed because they could not do the work?—I was told that that was the reason.

Did you ever see an official letter giving that as a reason for removing them?—No.

Were you the man who was put in charge of the work?—Yes.

Were you officially told that the others could not do the work?—Not officially.

How did you form that opinion then?—We heard it from the parties concerned.

The *President.*

Comparing the general education of Engineers educated at the different Engineering Colleges in this country, which do you consider the better educated?—I think the Rurki College men, because under the rules no one is admitted to the College who has not taken his B.A.

Comparing the general education of Cooper's Hill Engineers and of Engineers educated in this country, which do you consider the better educated?—I have had no opportunity of forming opinion.

Have you any reason to complain of the pension or leave rules in your Department? Only that I wish that the concessions lately made to Engineers from England may be extended to Natives also.

Do you consider that the rule which prohibits the promotion of men from the upper subordinate to the Engineer establishment is one which ought to be maintained?—I think the rule should admit of exceptions being made.

The Hon'ble Colonel *Trevor.*

In what year did you enter the service?—1860. My present pay is ₹800.

Sittings at Allahabad.

WITNESS No. XXI.—*11th April 1887.*

India.
P. W. Department.
Section III.
Col. Swetenham.

Examination of COLONEL EDMUND SWETENHAM, C.E., Bengal Staff Corps, Superintending Engineer, Allahabad Circle.

The *President.*

When did you join the Department of Public Works?—I passed through the Rurki course and joined as a Civil Engineer in 1853. I rose to the rank of first grade Assistant in the Public Works, and was offered a cadetship in the Bengal Infantry in December 1856, which I accepted. I rejoined the Public Works Department in 1859 as Assistant Engineer, first grade, and have been in the Department ever since. I have had experience of irrigation and also of military and provincial works, —that is, roads and buildings.

Will you kindly explain to us the constitution of your Department?—The Provincial Establishment are at present working in two branches or corps, the provincial and the local. Under the present system we may treat the division as the unit, because these two corps work through it. At present these corps are separate, but I believe amalgamation is contemplated and is in part carried out. The local works are carried out by the District Engineer, who becomes the unit for that branch and whose jurisdiction is confined to works within the district. The provincial works are carried out in three subdivisions instead of in six districts; the Executive Engineer manages one and the subdivisional officer the other, so that all through the province we have two men doing the work of one. With Sir Alfred Lyall's permission we have adopted a different system, as a tentative measure, in three divisions. Under the new system the district becomes the unit, and all works in it, whether local or provincial, are carried out by the District Engineer. The District Engineer's staff is slightly strengthened, but still something is saved by getting rid of the subdivisional officers. In divisions where the old system prevails, the two works are paid for out of separate budgets. This, however, is to some extent arbitrary; for instance, funds are taken out of the provincial revenue to very largely supplement the local funds and place in the hands of the local bodies a large sum of money, which they administer under the denomination of local and corporate funds.

Are the Engineers, employed in the provincial and local branches taken from the same class?—No. District Engineers are taken from the upper subordinate grades, and sometimes even from the lower. The men employed upon the provincial works belong, as a rule, to the provincial establishment. Of late, however, the province has been engaged, amongst other things, in railways, so that it has exceeded its establishment by nine men, and these nine men had to be obtained from elsewhere. But, as a rule, the men all belong to the same establishment. Their pay differs in some cases, as certain districts are considered more wealthy and important than others.

The *President*—contd.

Has a Local Funds Board absolute power to appoint whom it pleases?—So long as the qualifications of the candidate have been approved by the Chief Engineer or the Government; as a rule, they have asked the Government to choose for them.

Is it necessary for the Government, in selecting Engineers, to consider the requirements of Local Boards?—Yes; but not as distinct from the provincial establishment.

We are urging Government to give the District Boards complete control of all the funds administered by them. They will be empowered to decide what works shall be done, and according to what designs; but they will not be responsible for the execution of the work. When they have settled the designs and allotted the funds, it will be for the Provincial establishment to carry out the work. Under this system the District Engineer again becomes part of the provincial scheme; and, therefore, in his professional work, he is under the control of officers senior to him and with much greater experience. These officers will examine and direct his work and give him such instructions as may be necessary.

Is there any system of inspection of Local Fund works?—Yes, they are inspected once a year, but under the present system the inspecting officer is not allowed to give orders. The work may be infamous; he may be perfectly certain that if a scaffolding is not taken down and re-fastened two or three men will be killed, but he may not give orders; all he can do is to make a note of the fact and report to the Commissioner.

You have had to do with these Local Boards to a considerable extent?—Yes.

And you consider that the system in the past has been a bad one?—It could not have been worse. The Assistant Engineers and upper subordinates are practically without supervision of any sort from one end of the year to the other. In the future, if the project which is now under trial is carried out, these gentlemen will be supervised by the provincial Department of Public Works.

Will that cause any diminution in the number of Engineers employed on public works in the province?—Yes; we shall reduce about two Engineers in each division, so that two subdivisions will be dispensed with; and I think we could also reduce two subordinates in each division.

For the district is it the senior man, whether a first or second class Executive Engineer, who is the District Engineer?—Yes. Under the new system he will be relieved of all accounts and be perfectly free to exercise supervision over the Engineers in the six districts. He will be a Superintending

The *President*—contd.

Engineer on a small scale, and he will also make the designs in the district.

How many Executive Engineers do you employ?—One for every division in the North-West Provinces, and one for every two divisions in Oudh. They are directly responsible for the quality and execution of the work. There are only three Superintending Engineers in the two Provinces. They are, as it were, the eyes of the Government which sends them to see and report what is going on. All designs for works above a certain value pass through their hands.

The Superintending Engineer will stand very much in the same relation to the Executive Engineer as a Commissioner in the Revenue Department does to his Collector?—Yes. He has nothing to do with the actual execution of the work. Over him there is the Chief Engineer. There are two Chief Engineers, one for irrigation, and one for roads and buildings.

You have had experience of Engineers of all classes?—Yes.

For work in India, do you consider the Cooper's Hill or the Rurki man the best fitted?—I consider them to be equally fitted. For the first five years or so, the Rurki man from his knowledge of the country, the language, &c., has an advantage over the other; but after a certain time, the length of which depends on the character and capability of the individual, they become about equal as regards efficiency; or it may be that the Cooper's Hill man becomes on the whole the stronger man.

Do you consider that the technical education given at Rurki is as good as that at Cooper's Hill?—Quite. I think the theoretical knowledge of both classes is equal, and I think they have the same opportunities of seeing works. It may be that the Cooper's Hill man sees works of a more miscellaneous kind; but for seeing the class of works we require—that is, bridges, roads and irrigation—the opportunities of both classes are equal. Both have had a college education for two years, and both have had a year's practical training.

Are the men you get from Rurki, Englishmen, Eurasians, or Natives?—They are of all classes, excepting non-domiciled Europeans, who are not now allowed into the College save for purely educational purposes. I was myself born and educated in India. My father was a Royal Engineer. He took his invalid pension and settled in India. I received my technical education at Rurki.

Have you met any Native Engineers of pure Asiatic descent who had been trained at Rurki?—Yes.

Have you ever entrusted such men with independent works?—Yes. I had a Native Engineer under me in charge of a Roads Division, including bridges. He was fairly good. He was perhaps too little self-assertive, but otherwise he did his work well.

Do you find that, as regards moral qualifications, firmness, decision, &c., there is anything to choose between the domiciled Europeans and Eurasians educated in the country and the young men who come out to this country?—I think, perhaps, the men who come out from England are a little superior in this respect; but it is not always the case.

The *President*—contd.

Were not several of your Rurki Engineers educated at hill schools?—Most of them were.

Physically are the average of your Rurki Engineers equal to the average of Cooper's Hill men?—Quite.

Are the furlough and pension rules sufficiently favourable to attract good men to the Engineering Department?—I think the later rules granted to the Stanley and Cooper's Hill men are so.

Do you think they ought to be extended to all classes of Engineers, Europeans and Natives alike?—Yes. I think we ought not to have any distinctions of the kind in the same service. All classes work for the same pay, and ought to have the same pension and furlough,—provided, that is, that in the case of Natives of India the more favourable furlough is granted only on the understanding that it will be spent in Europe or America. I think a man acquires breadth of view by foreign travel in addition to the opportunity it gives him of studying engineering works out of India.

Is there any difference at present in the pensions paid to the different classes of Engineers?—Yes. Cooper's Hill and Stanley Engineers are given a higher rate of pension, and can draw their pensions at an earlier date. I think it desirable that these privileges should be extended to all Europeans in the service.

Why not to Natives also?—Because I think Natives' expenses are not as great.

Is it desirable that Government should have power to pension a man at a somewhat earlier period of his service than they are authorized to do by the present rules?—I think Government should have power to retire inefficient officers on very small pensions.

You advocate a system of graded pensions?—Yes. I have known instances of men who were not efficient, and who were kept on simply because of the reluctance of their superiors to insist on their retirement without pension.

The grade immediately below the Engineers is that of upper subordinates?—Yes.

Do you require a certain professional training for that grade?—Yes. The grade is mainly recruited from Rurki. It is composed of domiciled Europeans and Eurasians and pure Asiatics, and in a certain proportion of men taken from the army.

Would you promote from that class to the Engineer grade?—I think not. They take many years to attain to the higher subordinate grades, and as the promotion would only be from the very highest of these grades, as a rule by that time they would have reached an age when it would be undesirable that they should begin again as Engineers in the lowest grade. Our present practice is to give them honorary rank, to make them Honorary Assistant Engineers.

Why should they not be put on the same footing as Assistant Engineers. Do they do the same work?—Yes.

Would you not increase the efficiency of the intermediate and lower branches of the service by offering occasional promotion to the upper subordinate grade? Ought not the public service to be like a profession in this respect, that merit where it is extraordinary should be pretty sure of

India.

P. W. Department.

Section III.

Col. Swetenham.

The *President*—contd.

getting extraordinary reward?—Yes. We have men in the upper subordinate grades who well deserve to be promoted. I think it is desirable at times to allow the promotion from the upper subordinate to the Engineer establishment of men of exceptional merit. The Honorary Assistant Engineerships have hitherto been acquired by seniority; but mere seniority does not of course entitle them to that rank. They must have been specially reported on.

Is it desirable that a certain number of soldiers should be allowed to join the subordinate grades of the Department through Rurki?—I think so. They are strong men, and we want strong men as a rule. The army affords a very fine field for picked men, and we do not get more than ten or twelve a year with the whole army to choose from. I think they are a better class of men than you could get by recruiting locally.

Where do you get your Overseers from?—Entirely from Rurki.

Is there any ground for the complaint which used to be made, that the Overseers in the Public Works Department are not very straight in their dealings?—That is a very difficult question to answer.

Have we improved the class morally since we adopted the system of training them at Rurki?—I think not. I think our Department is much the same as it always was. We take the precaution of placing Engineers over them.

The *President*—contd.

Have instances of corruption in your Overseers been less frequent of late than they used to be?—I think perhaps they have.

The Hon'ble Mr. *Quinton.*

Do you employ any Bengalis in the public works here?—We have had a few, but nowadays they are not eligible for employment here unless they come through Rurki. We would not take a Seebpore man. Bengalis are supposed to have Bengal as their field of employment.

The *President.*

Have you heard any complaints about subordinates' pensions?—No. I wish to bring to the Committee's notice that Apprentice Engineers are at present appointed from the Rurki College, on probation for one year, on a salary of ₹100 a month; that being, as a rule, the sons of poor parents, who have at much personal sacrifice kept the lad for two years at Rurki, all further help generally ceases when he gets the appointment. ₹100 is insufficient to keep the youngster in the position into which he is appointed, and hence he is often thrown into debt and difficulties on starting on his professional career. I recommend that the allowance during apprenticeship be increased to ₹150 or even ₹200. Government in thus giving him enough to live on will free him from difficulties and secure a better officer.

Witness No. XXII.—*11th April 1887.*

Major Corbett.

Examination of Major F. V. Corbett, R.E., Executive Engineer, 1st grade, Irrigation Branch, Agra.

The *President.*

I believe you are in the Irrigation Branch of the Public Works?—Yes; I have been twenty years in that branch.

What officer is regarded as the unit of a district or division in the Irrigation Branch?—The Executive Engineer. He has charge either of a canal or a portion of one. He has subdivisional officers subordinate to him. They may be either Assistant Engineers or junior Executive Engineers, or upper subordinates. These Assistant Engineers or junior Executive Engineers are there, in fact, for training. They are Assistants to the engineer, and are entrusted by him with their duties according to their ability and experience. Above the Executive Engineer is the Superintending Engineer. He has charge generally of from five to six divisions. The divisions vary very much in extent, from one hundred to eighty miles of main canal, and say five hundred miles of district bridges, and, perhaps, fifty miles of drains. The duties of an Executive Engineer in the Irrigation Branch are to keep the canal in repair, to make considerable extensions and improvements as it may from time to time seem necessary or advisable. He has also to regulate the distribution of water, which in times of drought is of course his chief care. In times of drought his is a very responsible position.

Has he anything to do with the assessment of the water rates?—Yes, with the assessing of the rates, but not their collection.

The *President*—contd.

Who orders prosecutions for offences?—He does. Reports are made to him of any breaches of the Irrigation Code, and he sets the law in motion. The Deputy Magistrates are empowered by law to dispose of such cases, and also, in an administrative sense, to take up cases on their own responsibility. Ordinarily speaking, prosecutions under the Act would nearly always be instituted by the Executive Engineer. The Deputy Magistrates, of whom I am speaking, form part of the Irrigation establishment. They are at the head of what I may term the Revenue Branch; but of course, as Magistrates, they are subordinate to the Magistrate of the District; in all other respects they are subordinate to the Executive Engineer. Their pay ranges from ₹200 to ₹400. They are invariably Natives promoted from the Zilladars. In the 1st grade of Deputy Magistrate, on ₹400, there are two Hindus and one Mahomedan. In the 2nd grade on ₹300 there are four Hindus and one Mahomedan. In the 4th grade there are three Hindus and two Mahomedans. Under them are the Zilladars, whose duty it is to distribute the water and measure the irrigated crops. They are exceedingly important officers, and their position is one of great responsibility. They are invariably Natives. Only one grade receives ₹100. Of the eight men in this grade three are Hindus and five are Mahomedans. In the 2nd, 3rd, and 4th grades there are seventeen Hindus and fifteen Mahomedans. It is very difficult to say whether the Hindus or the Maho-

The *President*—contd.

medans do the better work. I have personally a predeliction for Mahomedans for the work we have to do, because they are more energetic. The best Deputy Magistrates and Zilladars I have known have been Mahomedans. In education the Hindus are superior.

The Hon'ble Mr. *Quinton.*

I suppose the Hindus belong generally to the clerical class?—Yes; Khaisthas and Bunnias. We have no domiciled European or Eurasian in the lower subordinate establishment of the Irrigation Branch; the pay, from ₹50 to ₹70, is too small to attract them. In the 1st grade of the upper subordinate establishment there are two Europeans and one Mahomedan. In the 2nd grade there is one European, and in the 3rd grade there are four Europeans and one domiciled European. In the 1st grade of Overseer there are one domiciled European, one Eurasian, and two Hindus. In the second grade there are four Hindus, one Mahomedan, and one non-domiciled European.

For the upper subordinate establishment, which of the four classes—*viz.* military men, non-domiciled Europeans, domiciled Europeans, and Natives—do you consider the best?—Some of the picked military men are excellent, and some few Natives also are excellent men. I have also known an exceedingly good domiciled European. They are all educated at Rurki.

Do you consider it desirable to allow men from the army to pass through Rurki to these appointments?—I know of no better source for the kind of men we want for canal heads.

They are men who have, generally speaking, received a good education or they would not attempt to go through the Rurki course?—Yes. Of course they are failures sometimes. Not having been much employed on construction work, I have not come across this class so much as many officers have. I have never personally had any trouble with them.

Is there any class of work on which they are indispensable?—They are not indispensable, but it is desirable with a view to the efficiency of the service that we should still recruit from that source.

Are these European Subordinates employed in direct relation to the people in any way?—Only when they are given charge of subdivisions. The charge of a subdivision brings them directly into relations with the people.

The Hon'ble Mr. *Quinton*—contd.

Does any friction result from that?—I have not found it so; but then, the men I have experience of were picked men and had been fifteen years in the service.

Contrasting the average Cooper's Hill man with the average Rurki Engineer, do you see any superiority in either?—I think there is a decided superiority in the Cooper's Hill men which is owing to their English training and distinctly not to their technical training. The technical training at Rurki is excellent. I have a pretty general idea as to what that training is.

Is it such a training as is likely to produce a competent Engineer?—So far as it goes. It is only a two years' course.

So far as technical training goes, you see no superiority in one class over the other?—I do not mean that exactly, because, in the first place, the course at Cooper's Hill is a very complete one and I think a longer one than that at Rurki. I have had a good many of both classes employed under me, and I should say that, taking the average, the Cooper's Hill men were somewhat superior in technical qualification.

When the Cooper's Hill men first come to the country, are they as useful as the Rurki men?—They are not nearly so useful to the Executive Engineer for the first year, but I think that in one year they pick up sufficient knowledge of the country to be of equal use.

As regards work in the field, which class is superior?—That depends on individual characteristics.

Do you consider the Rurki men are sufficient as regards technical education for the work of your Department?—Yes, with what they pick up afterwards.

Have you noticed which, as a class, have the more varied training?—The Cooper's Hill men, I should think.

Is it desirable that we should get all our men from one Engineering school in England or from other institutions as well?—I should prefer that the Engineers brought out from England had, as was the case with the Stanley Engineers, received their training in different institutions rather than in one institution. The Stanley Engineers who were first appointed were very good men indeed, though the later appointments from that source were certainly unequal.

Witness No. XXIII.—*11th April 1887.*

Examination of Alexander Grant, Esq., C.E., Executive Engineer, Irrigation Branch, N.-W. P. and Personal Assistant to Chief Engineer. *A. Grant, Esq.*

The Hon'ble Mr. *Quinton.*

You belong, I believe, to the Irrigation Branch of the Public Works. When did you enter the service?—In 1867, by competition at home. I have served all through in the Irrigation Branch. I have had under me both gentlemen educated at Rurki and at Cooper's Hill. Taking the average of both, I should say the Cooper's Hill men were decidedly superior, both as regards technical and general education. For the class of work we do in the Irrigation Branch I should prefer to employ Cooper's

The Hon'ble Mr. *Quinton*—contd.

Hill men. They have got their wits more about them. You can better depend upon them in an emergency. They have greater energy of character and bodily vigour.

The *President.*

At the same time I suppose that some of the best men at Rurki are equal to them as regards these qualifications?—Yes, but you do not find those qualities so generally among them as among the Cooper's Hill men.

India.

P. W. Department.

Section III.

A. Grant, Esq.

The *President*—contd.

Have you had any Asiatic Natives under you?—Yes; their work is very indifferent. I have only had experience of Bengalis in my branch of the service. They do not get on well with the people here. They have no command over them.

Were they educated at Rurki or Seebpore?—One man was educated at the Calcutta College, the others were educated at Rurki. We have only had about five or six of them in the Department since I entered it.

As Engineers what do you think of them?—That they have not the energy or go which is so necessary in an efficient officer. They will not push on work, and seldom or ever initiate anything. They are also wanting in administrative ability.

Have you had no Natives of Upper India under you?—Not as Engineers. We have them in the upper subordinate ranks, and in some posts they do very well indeed. In the Irrigation Branch, however, we have some very important charges, such as the head-works of the different canals, and in these it is absolutely necessary to employ Europeans. There is a greater liability to accidents at head-works, and the men in charge must have presence of mind and resource to enable them to act at once in emergencies. A failure of these qualities might have most serious results. The men in charge have to be constantly on the watch, and, in cases of flood, any delay in dropping the sluice-gates might involve serious floods and practically destroy the utility of the canal for a season, or even a longer period, and cause irreparable damage and serious loss of life and revenue.

I believe several of the men in the upper subordinate establishment are soldiers?—Yes, and these are the class of men I consider most reliable in emergencies.

Have they sufficient influence to collect labour?—Yes. They are selected and trained for that particular business. They are men who have been several years in the country, and are senior men who have had considerable experience.

Do the men who go to Rurki from the army, and furnish the class you are now speaking of, do so voluntarily?—Yes.

They are men who have left the army and elected an Indian career?—Some of them remain in the army. After they have been a year in the Public Works they are promoted to be Sergeants, and, after several years, to be Sub-Conductors. Some of them are men who have served their time in the army and returned to civil life.

Do they get a free education at Rurki?—Yes.

The *President*—contd.

Would you promote from the upper subordinate establishment to the Engineer branch?—Only in very exceptional cases. In the first place a man so promoted would have been a long time a subordinate and would necessarily be rather old, and he would have to commence as an Assistant Engineer when he was past his prime. Then, again, as a rule, his social position does not fit him for the post.

Do you think the system of conferring honorary rank is a good one? Is the position at all prized?—Oh, yes. It is a reward for long service. It is to a European what the title of Rai or Khan Bahadur is to a Native.

Have you ever heard any expression of discontent from Europeans with these honorary titles as inferior or as conferring what may be called a peculiar rank?—I cannot say that I have. In the Irrigation Department they are all military men and Natives who have this rank. None of our European civilian subordinates have had the title.

How is that?—Because they are juniors; only the five senior men are entitled to this honorary rank.

Have you anything to say about the Deputy Magistrates and Zilladar class?—They are all Natives. They do their work efficiently. They are all carefully selected from a large number, and they rise from the lower grades. A Zilladar enters the service either as a Sub-Overseer or as an Amin.

Do you consider the furlough rules for all members of the service are fair?—If it is intended to confine appointments to Statutory Natives of India, I think they are. I would maintain the distinction between men recruited at home and men recruited here. I would relax the rules in the case of Natives of this country only for the purpose of enabling them to visit Europe or America if they thought fit to do so. With regard to the pension rules to which I am subject, I desire to point out that they are so uncertain that an officer hesitates before accepting pension.

Are the pensions given to Rurki men less than your own?—Yes. There is, however, a class of men in the Department who, having had previous professional experience when they joined it, were admitted to the same pension rules as ourselves.

Is it fair to make a distinction in pension?—I think there should be some distinction in favour of men who have had an English education and are working in a foreign country.

WITNESS No. XXIV.—*11th April 1887.*

W. C. Wright, Esq.

Examination of W. C. WRIGHT, ESQ., C. E., Executive Engineer, Lucknow Division.

The *President.*

When did you enter the service?—Twenty years ago. I was born and educated in England. I entered Rurki under the rules which then allowed Englishmen to enter with a view to obtaining appointments in the public service. I have been engaged in all branches of the Public Works except Irrigation and Railways. I have been in the Military and Provincial branches. I have worked with Cooper's Hill and Rurki Engineers and had them under me. For the first two or three years or so I think the Rurki men are more useful, but afterwards I think the Cooper's Hill men are the better. The Rurki man does not improve, and of late years I do not consider we have had such a

The *President*—contd.

The *President*—contd.

good batch of men from Rurki as we used to get. I think their defects are owing to their having been brought up in India.

Is this falling off in the quality of Rurki men due to what is called the Rurki Resolution?—Certainly I consider those resolutions have had the effect of considerably deteriorating the quality of the men we have had of late years from Rurki. It has cut off the supply of Rurki men born and educated in England.

Taking the best of the Rurki men, are they equal to the best of the Cooper's Hill men?—Quite.

Then you consider that Rurki is as capable of affording a good education to intending Engineers in this country as Cooper's Hill?—Yes. I consider, however, that the general education which the Cooper's Hill men have had is superior to the general education which the majority of the men at Rurki have had, and the consequence of that is that although the professional education of both classes may be equal, the Cooper's Hill men are able to apply their professional education better than the Rurki men.

Have you any military men in the upper subordinate establishment under you?—Yes.

Do you consider it desirable that a certain proportion of your upper subordinates should be of that class?—Yes. I have had many of that class under me, and several of them have been very good men indeed, both as to work and steadiness.

Can you not get equally good Natives, domiciled Europeans and Eurasians?—For certain descriptions of work I think a Native would be better. For instance, for work in out-of-the-way places and districts where the European is less useful, you cannot send a European at a moment's notice to look after works away from headquarters, owing to his style of living. He cannot be put up anywhere as a Native can. He must have arrangements made for him. For working at headquarters he is the better man.

Suppose you had to make a hill road, whom would you employ?—A European.

The *President*—contd.

Do you think the Natives you get are equally able to stand exposure to climate and fatigue?—Yes.

In supervising positions which do you prefer, a Mahomedan or a Hindu?—A Mahomedan. He is more energetic, and I think he gets more work out of his subordinates.

Have you had any Hindu or Mahomedan in *quasi*-independent charge?—Yes.

How do they work?—They require supervision.

The Hon'ble Mr. *Quinton.*

Is it proposed to amalgamate the Local and Provincial Engineer establishments in your division?—Yes.

What has been the result of the double system up to the present?—It has been expensive without corresponding efficiency. It has been expensive because two men were employed to do the work of one, and inefficient because for the local establishment there was no supervision at all.

In the new arrangement the recruitment will provide for local as well as provincial wants?—Yes.

The *President.*

Have you anything to say about pensions?—I consider it a hardship that I am not entitled to pension on the same footing as Cooper's Hill and Stanley Engineers until I arrive at the Superintending Engineer's grade, if I ever do arrive there. As regards furlough, I consider that the rules which apply to Rurki men were framed at a time when it was contemplated that the class who would avail themselves of furlough would never go out of the country. I consider it desirable to encourage men to go to England by giving them longer furlough for that purpose, but those who stay in India ought to get only half furlough.

Is it desirable that men should be able to take pension at an earlier period without being called upon to produce a medical certificate?—Yes. Cooper's Hill and Stanley men can do so now after twenty years' service.

Witness No. XXV.—*14th April 1887.*

Examination of F. T. Atkins, Esq., President of the United Railway and Government Servants' Association, and a Member of the Committee of the local Eurasianand Anglo-Indian Association, Allahabad. *F. T. Atkins, Esq.*

The *President.*

I desire to give evidence regarding what I consider to be the qualifications of domiciled Europeans and Eurasians for employment in the Public Works and Telegraph Departments. The Association with which I am connected are strongly impressed with the belief that the number of Civil Engineers trained at Cooper's Hill might be considerably reduced, and the number passed in from the Indian Colleges considerably increased without any loss of efficiency to the public service, and greatly to the financial interest of the country, in that their employment would secure the expenditure in the country of the bulk of the salary they receive. The number of appointments made from the Indian Colleges is inconsiderable, if regard is had to the number of domiciled Europeans and Eurasians who would avail themselves of the training supplied by those institutions when all restriction on their employment in the public service is removed. The classes with which I am specially connected are anxious to obtain larger facilities for the professional education of their sons. While the Rurki Resolutions were misunderstood, those classes abstained from resorting to the Engineering Colleges in India in any degree commensurate with the progress of education among them. In the southern Presidency, I believe one appointment only per annum is given to the Engineering class, and one appointment to the same class in Bengal.

The *President*—contd.

India.

P. W. Department.

Section III.

F. T. Atkins, Esq.

The *President*—contd.

Again, I consider that the number of appointments which are now made from Cooper's Hill to the Telegraph Department unnecessary. Our Engineering Colleges have a staff capable of imparting efficient elementary instruction, and in the Department itself there are a sufficient number of highly-trained Mechanical Engineers from whom students in this country may receive practical instruction whilst serving under them in the lower grades of the service. I may mention, as instances of the capacity for efficient service of the class I represent, four gentlemen—Messrs. Barley, Hill, Darling, and Richardson—of whom the two first have now retired on pension. Cooper's Hill men on arrival in this country are placed under Sub-Assistants trained in this country in order that they may obtain a knowledge of their work. I may here mention that during the last year I have received from all parts of India applications from Telegraph Masters and Telegraphers inviting me to draw public attention to the obstacles interposed to their promotion by the introduction into the superior grades of the department of men trained at Cooper's Hill. My attention has also been called to the anomaly that a Telegraph Master receiving ₹275 may on promotion to the grade of Superintendent be compelled to receive a salary of ₹250 only. It has also been represented to me that the recruitment from Cooper's Hill exceeds the present requirements to such an extent that men in the superior grades of the Telegraph Department have to be

The *President*—contd.

employed in office work. As to the subordinate grades of these departments, I desire to point out that, owing to the present system of short service, a large number of men from the European army take their discharge and settle here; and that it is desirable to find State employment for such men, seeing that they would be of inestimable service to the country in the event of frontier or other disturbances. In this view they might be encouraged to study at the Engineering Colleges to a greater extent than they have hitherto done, by holding out to them a prospect of employment in the subordinate grades of the Public Works, the Railways, and the Telegraphs. These men marry in the country and for all practical purposes become domiciled. Practical experience has proved that men trained in this country have discharged efficiently the duties for which labour is still largely imported by the Government—for instance in the locomotive and traffic departments of railways. Mr. Rickie, Locomotive Superintendent, Punjab State Railway, received his training in this country. Mr. Young, now deceased, a Eurasian, was a Locomotive Superintendent in the East Indian Railway. So also Mr. Hindmarsh of the Eastern Bengal Railway and others too numerous to mention. Messrs. Hill, McPherson, Comrey, Burbridge, Wilkinson, Indball. Hawkins, and Craik have all risen to responsible positions in the various railways of the country. Out of the twenty locomotive stations on the East Indian Railway, twelve are in charge of Foremen trained in India.

Sittings at Lahore.

WITNESS No. XXVI.—*20th April 1887.*

Major J. W. Ottley.

Examination of MAJOR J. W. OTTLEY, R.E., Superintending Engineer, Irrigation Branch, Public Works Department, Punjab.

The *President.*

How long have you been connected with the Public Works Department?—Seventeen years, during the whole of which time I have been in the Irrigation Branch, and, with the exception of two years in Bengal, my service has been spent in the Punjab, in almost every district of which I have served.

Have you had experience of the work of officers of every class who have been engaged in the Public Works Department?—I think so.

Will you give us your opinion of the relative merits of the three classes of Engineers, *viz.*, Stanley Engineers, Cooper's Hill, and Engineers educated in the Indian Engineering Colleges?—I do not think there is anything to choose between the best men of all classes. I have seen as good men come out of Rurki as from Cooper's Hill. There is of course great inequality in the Cooper's Hill men, but the best of them are equal to any men in the world. Half of those I have known were very good and the remainder moderate down to very bad. Of the Rurki men I have known—and I have known some of the best of them—half of them I should say were good; but of those nearly all were Englishmen who had come out from England and passed through Rurki.

Have you met any of the men from Rurki

The *President*—contd.

who had received their general education at the hill schools?—I think so, and I believe some of them were equal in every respect to the men who had been educated in England; but I think the Cooper's Hill men are as a rule men of higher social standing and of better general education.

We have been informed that during the earlier years of their service the Rurki men are more useful than the Cooper's Hill men, but that after a few years the latter equal and even become superior to the former?—There can be no doubt about it. In the earlier years of service there can be no comparison between the Rurki man and the Cooper's Hill man. You do not require great qualifications in an Assistant Engineer, but there can be no doubt that every young Rurki man comes to the service fully prepared to do the work. He knows the language and the country, whereas a Cooper's Hill man, with considerably greater intellectual powers knows nothing of the country, and has to undergo a period of apprenticeship in order to acquire that knowledge. I think that instead of passing their two years' practical course in England, a training which to my mind is absolutely useless to them, the men recruited from England should pass through a practical course in India, and during that time should be required to learn the language, nobody

The *President*—contd.

being appointed permanently till he had done so. The works they would see here would be infinitely more useful to them in service. Of course my remarks have reference only to the branch of the department to which I belong, the Irrigation Branch.

Would they have the same opportunities here of learning the business of Mechanical Engineers as they would at home, supposing they wished to acquire that experience?—I am not sure whether my evidence on that head is of much value, but there are large workshops in the country where I fancy they would learn all that it was necessary to learn for service in this country.

Is there not a certain disadvantage in giving a number of appointments to students at Cooper's Hill in the fact that, being all trained in the same school, they come out with a similarity of ideas, a disadvantage which would be avoided if they were chosen from different colleges? Are they not too much of the same pattern?—I do not think they can be too much of one pattern.

At any rate you consider that the Cooper's Hill men have had a sufficient technical training, and that no change is necessary in the system of training pursued there?—I think not, leaving the practical course out of the question.

Are you acquainted with the course of training pursued at Rurki?—To a certain extent.

Do you consider it to be capable of turning out thoroughly good men?—It has turned out good men, but I do not see the necessity for it when you can get men under a better course at Cooper's Hill.

Have you had any experience of men from Seebpore and the Madras Engineering Colleges?—I have had Natives serving under me, but I cannot tell you from what Colleges they came: one of them certainly must have come from the Calcutta College, but it was years ago.

For the Irrigation Branch which do you consider make the best Engineers—Europeans, domiciled Europeans, or Natives?—I have no hesitation in saying Europeans.

In saying so do you distinguish between domiciled and non-domiciled Europeans?—The one or two domiciled Europeans I have met were very good men. I have not, however, had sufficient experience of them to be able to draw the comparison. I have never had a Eurasian Engineer under me.

As an Engineer officer in what respect does the Asiatic Native fail?—First of all in observation, and secondly in activity; and as regards Canal Engineers, there is the difficulty which arises entirely from themselves, of social intercourse. In jungly places, where it is impossible to live anywhere but in canal bungalows, where you must all live together, if you are all Europeans and all of the same social standing you can all live in the same room in the hot weather; whereas if you have Natives with you they also require to live in the bungalow, and where are you to go? A short time ago a European officer offered to "put up" a Native officer serving under him, to which offer the latter's reply was, "You forget I am a strict Hindu."

The Hon'ble Mr. *Quinton*.

And as regards coolness in emergencies?—There can be no question that a European is by far the best in cases of crisis and emergency.

And what might be the results of a failure in that respect?—Results most disastrous to the canal and to the whole country subject to irrigation, and a consequent failure of crops.

The *President*.

Are officers in the Irrigation Branch at all brought into contact with officers of the Civil administration?—Very largely so in all matters of assessment of land for irrigation, and also in magisterial matters. They have to pass the same examination as a Magistrate, and as Magistrates they are subordinate to the Magistrate of the district.

Who settles the rates chargeable for land under irrigation?—The Government of India on the advice of the Local Government. The Local Government settles them after consultation with the Financial Commissioner and, probably, the departmental officers also.

Are not the rates settled partly on the advice of the Collector and partly on the advice of the departmental officer?—Yes, in consultation.

Who collects the water rate?— The Collector. Every half-year we have to inform the Collector of the quantity of land under irrigation. We make out the field measurements and the demand statements, which are then sent to the Collector for collection.

Is the officer in charge of each irrigation district responsible for the supply of water to different areas?—Certainly.

Suppose there is a scarcity of water?—His responsibility increases at once, because he is obliged, against the wishes of the people, to close the upper parts in order to distribute the water fairly and equally throughout the district.

What is the extent of an Executive Engineer's charge? Who is the officer that answers to the Collector?—The Divisional Canal Officer. He is the unit of the Department, and under his immediate supervision there are subdivisional officers for whose work he is responsible.

How many years does it ordinarily take a man to attain to the post of Divisional Canal Officer?—From ten to eleven. A man enters the Department as subdivisional officer. Over the divisional officer is the Superintending Engineer of that particular circle, and over the Superintending Engineer is the Chief Engineer, who is also Secretary to Government in the Irrigation Department.

What work can the Divisional Canal Engineer initiate of his own motion?—He can work up to ₹200 without special sanction. Supposing the canal were to breach he must act on his own responsibility, reporting the matter to his superior.

What are the occasions which call for the exercise of those qualities which you seem to consider a European possesses in a superior degree to a Native?—Two such cases have just occurred. One was a breach in the Swat Canal embankment, which is about 60 feet high; it required instant action and was closed within three weeks at a cost of

India.

P. W. Department.

Section III.

Major J. W. Ottley.

The *President*—contd.

about R6,000. Of course the breach was reported at once, and action taken by the local officer. The other was the failure of a weir on the canal, when water was most urgently needed down below. The breach was closed within a week by the local officer, who attended to the work day and night. Had it not been promptly attended to, the loss to Government would probably have been four or five lakhs of rupees.

Do you consider Europeans are better in such emergencies than Natives?—I would prefer to have them.

And for the assessment of rates and the control of water when the supply is insufficient?—My experience is that you can only obtain a high degree of irrigation by constant activity and work; and, so far as my experience goes, I have not yet met the Native Engineer who will give that amount of activity and industry. I have had four Native Engineers under me; one was under me about fifteen years ago, and two others were so within the last four or five years. The first man was quite a young Assistant Engineer; the others were men of more standing. I cannot say where they were educated. One of them was a B.A., two of them were Bengalis; and to them and the Overseers, whom I have had under me who were Bengalis, the great objection was that they were afraid of the people and unacquainted with the language. It was almost impossible for any one to communicate with these Overseers. They talked English very badly and Hindustani possibly worse. The only language they understood was Bengali.

The Hon'ble Mr. *Quinton*.

I suppose your opinion as to the comparative merits of Natives and Europeans in your branch of the department is derived as well from your experience of them as Overseers as from your experience of them as Engineers?—Yes. I was once very strongly in favour of employing Natives of the Upper Provinces as Overseers in charge of subdivisions, and I got permission to try the experiment. The experiment has now extended over some three years, and I am very sorry to say that I have been obliged to give it up, as every subdivision I have put them into has deteriorated, although the men I employed were picked men of the upper subordinate establishment. One of them, especially was a very superior man, and could talk and read English as well as any of us, but he had no power of initiation or of observation. He would carry out any particular work you gave him well, but he failed when he had to start work or propose anything.

Taking them all round, are you of opinion that you get fewer bad bargains from Cooper's Hill than from Rurki?—I can say this, that if I were allowed to choose from a number of men from Rurki and Cooper's Hill, I should choose the men from Cooper's Hill with the alteration in their training I have suggested. One of the main arguments used by me, when I obtained permission to put Native upper subordinates in charge of subdivisions, was that they would work cheaper than (and probably as well as) Europeans. After several years' experience of these men (the very best men I could pick), I can safely say that they have not worked cheaper and they have certainly done worse work on the whole.

WITNESS No. XXVII.—*20th April 1887.*

R. Bradley, Esq.

Examination of R. BRADLEY, ESQ., Executive Engineer, 2nd grade, Irrigation Branch, Public Works Department, Punjab.

The *President*.

I believe you are in charge of the second division of the Bari Doab Canal. Where did you receive your technical education?—At Rurki. I was born in Ireland and came to this country at an early age with my step-father who had settled here. I was educated at St. Xavier's College, Calcutta, and afterwards at Rurki. I entered the Public Works Department in 1868 after a competition. When I entered Rurki the rule was that there should be a competition for appointments; and the candidates in each year were usually more than the number of vacancies. It so happened, however, that the year I entered the College the number of candidates was not in excess of the number of vacancies. I stayed at the College for about a year and ten months and went through the usual course. I then joined the Punjab Public Works Department as an Apprentice Engineer on the Western Jumna Canal. My service has been throughout in the Irrigation Branch and in this Province. I am the officer in whose division occurred the breach in the weir which has been mentioned by Major Ottley.

Do you consider that the training which students at Rurki undergo is sufficient to qualify them to hold appointments as Engineers in the Public Works Department in India?—I think so.

The *President*—contd.

Did you notice any deficiency in your own training when you came to practical work, as compared with the training which officers educated elsewhere had received?—I have felt that I was not the equal of some of my colleagues in Mathematics. Mathematics, however, is a subject which is not often required in our work; and I may add that this defect is perhaps rather owing to myself than to the training which was given at Rurki.

Comparing the men trained at Rurki and at Cooper's Hill, are you able to say whether one class is or is not superior to the other in technical training?—I think they are about equal, except that the Cooper's Hill man at the earliest period of his service is not so useful, owing to his want of local knowledge.

Have you served with many Native Engineers?—I have only met one in the whole course of my service, and it would therefore be hardly fair for me to express an opinion as to the whole class. I have had several Natives under me as subdivisional officers and in the upper subordinate ranks of the service.

Comparing them with Europeans as a class what do you think of them?—I have found

The *President*—contd.

them very often to be well educated and intelligent men, but wanting in energy and backbone; and also they do not command the good-will of the work-people to the extent the European officers do. The men I refer to specially are Punjabis. One is a Hindu and the other a Mahomedan. The Hindu came from Sirhind; where the other came from I do not know. They were both in charge of subdivisions. They did their work very poorly indeed; in fact they never rose above the level of ordinary subordinates. They did not manage their subdivisions at all in any sense of the term. They always waited until the Executive Engineer inspected and ordered the work, and were dilatory also in carrying out orders when work had been sketched out for them.

Colonel *Home.*

Has not a subdivisional officer frequently to act on his own responsibility in emergencies?—Yes.

The *President.*

Did these men do so?—I did not find that they did. They were particularly bad in that respect.

Have you anything to say on the subject of pension and furlough rules of officers in your department of the service?—I do not know exactly how I stand. As a Rurki man, I believe I come under the general rules applicable to uncovenanted officers, and such a pension as I shall get is certainly not a very happy prospect to look forward to.

As regards furlough, do you consider that all the officers of the Department, whether appointed from the Indian Colleges or Cooper's Hill, should have the same furlough rules?—Certainly in respect to furlough spent out of India.

Do you consider that officers of all classes should be on the same footing as regards pension?—Certainly. We have all exactly the same wear and tear, and it is exceedingly hard that a man should be under less favourable rules because he happens to belong to a particular class.

Do you consider that it is necessary to offer additional inducements in the way of pay, furlough, and pension for men to come out from England and take up Engineering appointments here, or do you consider that we can get as good men from the Indian Colleges?—I have some doubt as to whether we have a sufficient supply of men in this country, but the quality of the men we get here is quite as good as that of the men who come out from England.

The Hon'ble Mr. *Quinton.*

Do you think you would be able to supply the whole of the Engineers wanted for this country from the Indian Colleges?—I cannot say, but on the understanding that there are only nineteen appointments in the Department every year, I think the whole of India could supply the number required.

Would it be to the advantage of the Department to rely altogether on men educated out here?—I do not think it would be.

You think there is an advantage in having an admixture of men from England?—Yes.

In the revenue branch of your duties I believe you are constantly brought in contact with civil officers?—Yes.

The rent-rolls are in fact prepared by you and made over to the Collector?—Yes.

And any differences of opinion that may arise are settled by whom?—By the subdivisional officers first and finally by the divisional officer. That is to say, all disputes are referred in the first instance to the subdivisional officers, who pass their orders, and the papers are sent on to the divisional officer for confirmation.

Is the laying out of new distributaries done in consultation with the civil officers?—No; except in so far as you obtain any information you require in connection with the settlement papers and the land from them.

The *President.*

Is it desirable that a divisional officer in the Irrigation Branch should be of such education and social position as to be able to hold his own with the revenue authorities when questions arise, and it becomes necessary for both to express an opinion?—Quite so.

Colonel *Home.*

May not a Divisional Canal Officer have to deal with more than one Collector at a time?—Yes.

WITNESS No. XXVIII.— *20th April 1887.*

Examination of T. HIGHAM, ESQ., M.I.C.E., Superintending Engineer, 3rd class, Irrigation Branch, Public Works Department. *T. Higham, Esq.*

The *President.*

Where did you receive your technical education?—In England. I am what is known as a "Stanley Engineer." I received my first appointment by competition. I had previously studied Mechanical Engineering for a year in the locomotive department of the London, Chatham, and Dover Railway, and afterwards served an apprenticeship for 2½ years to a Civil Engineer. I entered the Public Works Department in 1867.

The *President*—contd.

I was first posted to Madupore Workshops, where I was for a year, and then I was posted to the Bari Doab Canal as an Assistant Engineer, and I was there for about seven years. I have been ever since in the Irrigation Branch of the Department. I have had experience of the work done by Cooper's Hill and Rurki Engineers, and I may say that almost all the Rurki men with whom I have had to do have been very

India.

P. W. Department.

Section III.

Major E. Harvey.

The *President*—contd.

disposed of in many ways; perhaps by having a larger percentage of good subordinates. Also work in a division or subdivision may normally be ordinary; but the Engineer must be prepared to tackle higher work directly it occurs within his district. Moreover, you must have men who are qualified for promotion to the higher appointments; and I certainly think you will get a larger percentage of such men from Cooper's Hill than you will from among Europeans at Rurki.

At the present time Cooper's Hill has fifteen out of the thirty appointments in the year ?—I was not aware of that, and I would maintain this proportion. I was merely looking at the question from a purely departmental point of view without reference to the class from which the supply was taken; but now, looking at the question purely in the interests of the Department and not from the standpoint of other interests, which may yet have very great weight, I adhere to my former statement, that there should be at least two Cooper's Hill men to one Rurki man in the Department.

Have you met any of the men who were educated at the hill schools here?—One of my European Assistants was educated at a hill school.

Do you consider that the men educated at Rurki approximate in efficiency so nearly to the Cooper's Hill men that we might recruit from them more largely without danger to the efficiency of the service?—I do not think so. I think you would lose the percentage of first-class men you want for specially high or difficult service.

You are aware that military requirements necessitate the employment of a large number of Royal Engineers. Would not the Royal Engineers afford a sufficient supply of men for the services you refer to?—No, because under the present system they are all swallowed up by the Military Works Branch.

The Hon'ble Mr. *Quinton.*

Your scheme would appear to exclude Natives altogether?—No. When I said I would appoint two Cooper's Hill men to every one Rurki man I did not mean to exclude Natives. I meant that Cooper's Hill men should be to Rurki Europeans as 2 to 1, but I did not know the standard proportion of 15 : 9, and as the 9 includes both Europeans and Natives, my proposal is not capable of comparison with the existing rule; but as I would have 1 out of 3 Europeans Rurki men, it is evident that if the Rurki Natives be added, I would positively increase instead of diminishing the *total* proportion of Rurki men.

The *President.*

How many Natives would you have in the Department?—I have not considered that point. I wish, however, to say that out of twelve or thirteen Native Engineers in the Punjab there is not a single Mahomedan. Riding about among wild border Mahomedan tribes and visiting outposts commanded by Native officers, the Babu is entirely out of his element. He hates the place, and he is quite unsuited to it.

Are you speaking from your experience, or of instances that have come to your knowledge, of such employment having been refused by a Native officer?—Decidedly. They have done everything in their power to get out of it. I do not say there might not be exceptions, but the feeling exists, speaking generally, and is peculiarly noticeable among the Hindu subordinates.

The *President*—contd.

You have, I believe, Europeans, Eurasians, and Asiatics in the upper subordinate grades?—I have had very little experience of Europeans in the upper subordinate establishment.

Have you known any Native upper subordinate whom you considered fit for promotion to the Engineer establishment?—No.

Is it desirable to allow such promotion?—No. I think the general education of men in the upper subordinate establishment would be found deficient, and that in very few instances, as the grade is at present constituted, would their professional education be sufficient.

How is the upper subordinate establishment recruited now?—By promotion from the lower subordinate grade and by direct appointment. In the last 2 or 3 years promotion from lower subordinates has been checked. I said that the upper subordinates I have known best were all promoted from lower subordinates.

Do you require the production of any certificate showing a technical training?—No. My experience is almost entirely confined to subordinates who came from Rurki and in their course have been promoted.

Have not the subordinates from Rurki to produce a certificate when they first enter?—Yes; they pass out of Rurki with certificates.

Do not their certificates entitle them at once to enter the upper subordinate grade?—Yes. The system has lately been a good deal extended, but my experience of it is not extensive.

Speaking from the opportunities you have had of seeing the work of Natives in the upper subordinate and subordinate grades of the Public Works Department, have you formed any opinion as to their special aptitude or otherwise for Engineering work. Do you find them as ready in emergencies as Europeans?—No.

Are they more careful in the execution of their work?—No, rather the other way.

Are they as good as supervisors of labour?—I think a good Native subordinate who means to do his work is an efficient supervisor of labour. I have been fairly satisfied on the average with all my subordinates. I should say that the percentage of European subordinates, who bring bad work or faults or mistakes to notice, would certainly be larger than that of Native subordinates, assuming honesty in both.

The Hon'ble Mr. *Quinton.*

I suppose most of the provincial work in this province is of a very ordinary character?—Yes; a great deal of it does not call for high professional ability. I wish to say that I have found Native soldiers, who had been through Rurki, particularly good as subordinates, and I should like to have as many of them amongst my subordinates as possible.

Do you think you can get good European upper subordinates for the salaries offered?—I have little or no experience of European Subordinates, but I should say that the scale of pay would certainly subject most of them to temptations.

WITNESS No. XXX.—*20th April 1887.*

Examination of E. E. OLIVER, ESQ., M. Inst. C.E., Under-Secretary to Government, Punjab, in the Public Works Department, General Branch.

The *President.*

Where were you educated?—In England. I came to India in 1868 under covenant with the Secretary of State. Since then I have served in the Irrigation Branch of the Punjab Public Works Department, the Irrigation Branch of Bengal, the Secretariat of the Government of India, and of the Punjab.

Have you formed any opinion of the qualifications of the different classes of Engineers now recruited for the Department respectively?—Personally I see very little to choose between the really good men from Rurki and the good men from Cooper's Hill. I think equally good men can be got from both sources.

Is there any difference in the percentage of good men from each?—I think the larger percentage of good men come from Cooper's Hill. Out of our fourteen Native Engineers in the Punjab two are Sikhs, one is a Bengali, and the rest are Hindus. The Hindus, I may say, are not recognised as being of a particularly good social position. A certain number of them are Bannias. Not one of them is a Mahomedan in a province which is to a great extent a Mahomedan province. In fact there is not a single Mahomedan Engineer on the Public Works lists.

Is not that owing to the neglect of Mahomedans to take advantage of English education?—I think it is.

Comparing Rurki men of all classes, domiciled Europeans, Eurasians and Natives, which do you consider make the best Engineers?—Taking the Englishmen educated at Rurki, I think we have had from among them men who were quite as good as the men who have come out to India from England; but as regards Rurki men, Eurasians, and Natives of India, there can be no question as to the superiority of the Cooper's Hill men. Perhaps in the early part of his career the Rurki man does better than the Cooper's Hill man. That to a certain extent is due to his knowledge of the country which the Cooper's Hill man has yet to learn. I agree, however, with Major Harvey when he said that the better general education of the Cooper's Hill man would eventually tell in his favour.

Regarding the future recruitment for this Department, I have rather an idea that a great deal might be done if we had a larger number of men occupying a subordinate position. A large number of the men now employed in the Public Works could, I think, be obtained, and be quite as useful if employed on a much lower pay and status than at present. If, for instance, we recruited men on pay rising from, say, ₹150 to the pay of a Sub-Engineer, *viz.*, on ₹400, such men might be largely recruited in India, and a good number of them might be Natives of India. Such men are in England called "Clerks of Works" and have seldom a highly scientific training, nor have they necessarily to deal with payments of money. Such men might, in my opinion, perfectly well hold many of the charges, subdivisional and otherwise, now held by Assistant and even Executive Engineers. But for the higher professional duties required in the Department, I certainly think it is necessary to recruit largely from England. The majority of the Natives now recruited are, in my opinion, not suited for Engineers in the Public Works; for although there are among them men who would probably pass excellent examinations, they are as a rule deficient in very many of the qualities which are wanted. They are deficient in organization and administrative power, in self-reliance, and to a certain extent in probity.

The *President*—contd.

The Hon'ble Mr. *Quinton.*

Do you speak from your personal experience of the men?—Yes.

Do you include in Natives domiciled Europeans?—No, but I include Eurasians.

What is an Honorary Assistant Engineer?—He is a subordinate who has received honorary rank after reaching a certain grade. They belong to the upper subordinate department and they occasionally do the work of Assistant Engineer.

What duties do they discharge?—Duties similar to those of upper subordinate or Assistant Engineer. They have sometimes risen to the charge of Executive Engineer. A subdivision may, for instance, be in charge either of an Assistant, of an Executive Engineer, or an upper subordinate, and it may also be in charge of an Honorary Assistant.

How do Native and European members of the upper subordinate establishment compare with each other?—I have had a good number of Natives and Europeans in the upper subordinate establishment under me, and I think that, with the exception of the men who have been drawn from the Corps of Royal Engineers, I prefer the Native, because I think he is generally the more useful man. It is very difficult to get a good European on the pay of an upper subordinate, *viz.*, ₹60 to ₹400, whereas the pay to a Native is very good pay.

Is not ₹400 sufficient to attract good men, Europeans and Eurasians, in this country?—₹400 is only reached after very long service. As a rule a man is put in at the lowest grade, and rises through perhaps twenty years of service.

Do you consider that the kind of European you would get in the lower grades of the Department would not be equal to the Native you would get?—Certainly.

Is it desirable to promote from the upper subordinate to the Engineer establishment?—Not as matters stand at present.

You would extend the subordinate and diminish the Engineer service?—Yes; and then I think we should require fewer men from England.

Colonel *Home.*

Do you only refer to the General Branch?—More particularly; but as regards Engineering as distinguished from the Revenue work, I think much the same could be said of the Irrigation Branch. For the more important works you require a highly trained Engineer, but for the duties that are often delegated to subdivisional officers

India.

P. W. Department.

Section III.

E. E. Oliver, Esq.

Colonel *Home*—contd.

a class of men of the kind I have indicated would do equally well.

I wish to point out that the fourteen Natives in the Punjab Public Works Department are serving on exactly the same pay as the men brought out from England, although, as I think, the larger proportion of them are not worth the money. I admit that there are some among them who are most excellent Engineers, but at the same time there are among them men who would be very well paid on ₹200 to ₹250 a month. This is, I think, a matter which should be taken into consideration in extending employment to men of this class.

Colonel *Home*—contd.

WITNESS No. XXXI.—*20th April 1887.*

Rai Bahadur Ganga Ram.

Examination of RAI BAHADUR GANGA RAM, A.M.I.C.E., M.I.M.E., Executive Engineer, 3rd grade, Public Works Department, General Branch.

The *President.*

Where were you educated?—At Rurki. I received my general education at Lahore College. At Rurki I came out second on a list of eighteen. I joined the Department in 1873, and in 1883 I went to England, and became a member of the Institute of Civil Engineers and a member of the Association of Mechanical Engineers. I wish to say that I consider the strength of Natives to Europeans in the Engineering Establishment of the Public Works Department throughout the presidency is too small, and that if greater facilities were given to Natives in the Indian Colleges to enter the Department more would do so. By facilities, I mean a greater number of guaranteed appointments. In order to attract more Natives to the Public Works Department, the number of guaranteed appointments should be increased to 25, and the number over and above 25 of Natives turned out of the College should be distributed in other departments, such as the Accounts, Forests, Survey, Railway Traffic, and Telegraph. I consider the Natives who go to Rurki are amongst the best educated members of the Department in those subjects which are required in the Engineering profession, but that they have not the best general education. In proportion to the population few Natives have presented themselves at Rurki because it is only lately that Natives have appreciated the Engineering profession. A larger percentage of Natives has of late years got into the Department. Formerly there were eight guaranteed appointments for Rurki students; there are now only four or five. These eight appointments were given to Rurki thirty or forty years ago. I was not aware that the appointments which have been taken from Rurki had been given to the other Engineering Colleges.

Why should Natives who desire to enter the Forest Department not go to a Forest School?—I would give them some forest training. I have heard that the Forest Department rules are not very favourable to the admission of Natives, but I know nothing about that department personally. For the Telegraph Department they would require a special training which might be given at Rurki. The training they would get at Rurki would be sufficient to fit them for the Survey. As regards Railway Traffic, I consider that a knowledge of Engineering is necessary for that; I cannot say whether a knowledge of Book-keeping is more necessary. I know a little of the Accounts Branch of the service, and I think Engineering knowledge is certainly necessary there, if you are to understand the system of sub-heads. I wish also to say that there is only one Native officer in the superior Accounts Department throughout India. By Native I mean pure Asiatic. I do not know how many domiciled Europeans and Eurasians there are in this Department. The Government of India appoints the members of the superior Accounts Department. A good many of them are Royal Engineers. I do not know what qualifications are required for that Department. As regards furlough and pension, I wish to say that the rules should be the same for all, except that the extra furlough over and above what Natives enjoy now should be spent out of India. With the pay and pension rules as they are, I think as good Natives as we want would still enter the service largely, but I think improved pension and furlough rules will give us better men. I think Natives should be encouraged to retire earlier in order that they may start independent works while they have still some energy in them. I have not considered whether Natives would ever adopt the profession of Engineers outside the Public Works. Assertions have been made to the effect that Natives are wanting in certain qualifications. I have only to say that it greatly depends on their early training, whether they do or do not possess those qualifications. Self-reliance is developed by kind treatment, and, moreover, above the rank of Executive Engineer, Natives have never been tried. So far as they have been tried I believe they have succeeded. I know nothing about the Irrigation Branch of the Department. The superior knowledge of the country possessed by Natives must result in work being done more economically. I have been thirteen years in the service. After six years' service I received an independent position. I have myself effected economies in various directions. Natives can work at a more economical rate than Europeans. Europeans in my position pay higher rates for work than I do. I am at present engaged in the Aitchison College building, and I am paying less rates than my European predecessors did for the same quality of masonry work. That is owing to my knowledge of the country. I am getting pucca brick-work done for ₹24 to ₹25. It used to be paid for up to ₹30. I effected the reduction. I cut down the rates. I make my own bricks on the spot, which saves three or four rupees a hundred. I make my own lime also. My labour is done by task-work. There is no reduction in the labour; the whole of it is in the material. I do not think the labour contractors can make as much profit out of me. I was ordered by my superior officer to make the bricks on the spot. I do not claim it as an original suggestion of my own. As regards lime, I got no positive orders. In build-

The *President*—contd.

The *President*—contd.

ing the Aitchison College we have introduced a new system of making bricks, *viz.*, Bull's patent. We get stone-work by tender. I am not prepared to say a contractor will tender less to a Native than to a European. When I said work would be done more economically by a Native I merely referred to the purchase of materials. When the Aitchison College estimate was made I was called upon to report how the cost could be reduced, and I pointed out how the work could be done satisfactorily at reduced rates, and I was thereupon appointed to supervise the work.

But where did your superior local knowledge come in?—Local knowledge is required in the purchase of fuel for making bricks.

WITNESS No. XXXII.—*20th April 1887.*

Examination of LIEUTENANT W. R. HILLIARD, R.E., Deputy Examiner, 2nd grade, P. W. D., Accounts Branch.

Lieutenant W. R. Hilliard.

The Hon'ble Mr. *Quinton.*

What is your position in the Department?—I am Deputy Examiner, 2nd grade, in the Accounts Branch of the Public Works Department.

My office deals with both Irrigation and Buildings and Roads Branches of the Public Works Department; not with the Railway branch. The superior officers of the office consist of an Examiner, a Colonel in the Royal Engineers, a Deputy Examiner, who is an uncovenanted officer at present on leave, and myself. I am a Royal Engineer and have been three years in the Accounts Branch. I was two years in the Military Works office at Simla. I have never had a Native employed under me in the superior grades. There are thirty-four Accountants employed in the subordinate Accounts establishment of the province, of whom twenty-nine are Natives, pure Asiatics, and five are Europeans or Statutory Natives. The Natives form 85·3 per cent. oft he whole. In the Clerks' establishment 87·9 per cent. are Natives.

Have you noticed any difference in the quality of work of the European and Native Accountants?—I consider that Natives are better in some respects and Europeans in others. The Native, for instance, will take more pains in checking minute details which a European will not have the patience to do; but the European has greater breadth of character. I may add that Natives are very ready mental calculators.

As regards daily routine work, is not the man who checks details the more useful?—For Divisional Account work he is. There are two classes of Accountants, Divisional Accountants under the Divisional Engineers and Checking Accountants in the Examiner's office.

In which branch do you find Natives the more useful?—In the divisional offices and in the lower checking branches of the Examiner's office.

Does responsibility for the accounts rest with the Executive Engineer in any way?—Yes, entire responsibility.

I believe the superior grades of your Department are recruited in various ways?—In more ways I suppose than any other department in India. Every officer appointed in the junior grades has to undergo a very stiff examination in accounts before being permanently appointed. As a rule he goes in on probation, but senior officers are sometimes put in direct from various departments, such as the Government of India Secretariat and the Royal Engineers. They are put in

The Hon'ble Mr. *Quinton*—contd.

over the heads of men already in the Department. The Department is also very largely recruited from Cooper's Hill Engineer officers; in fact, it appears to be the policy nowadays to recruit from that source, and as a rule they serve in the Works Branches until they become Assistant Engineers, first grade; they are then brought into the Accounts as Deputy Examiners, second grade, of course to the detriment of the men already in the Accounts as Assistant Examiners. Then, again, men are brought in from general sources—men for instance who came out here looking for employment. They are nominated by the Accountant-General and undergo an examination after having been a short time in the Department. Lately a system of appointing Apprentice Examiners from outsiders has been adopted. A good many also are appointed from among the Accountants of long service to the rank of Honorary Assistant Examiners, who then become eligible for appointment as Deputy Examiners.

What kind of technical knowledge is required for service in the Department?—I think you want a good general mercantile education, certainly not an Engineering one.

What are the duties of an Examiner of Accounts generally?—To check the accounts sent in by the Divisional Engineer officers, and keep a general watch over their operations; for instance, an Examiner has to superintend the fixing of rates by the Divisional Engineer. He has to audit the pay of the various Public Works Department establishments, and decides all accounts questions connected with their pay and leave. The Sub-Divisional Engineer officer makes out the monthly accounts of works, which are then collected together in the Divisional office; from the Divisional office they go up to the Examiner's office to be checked. It is therefore of advantage to the Examiner to know from personal experience how these sub-divisional accounts are made out. This is an argument used for the employment of Engineer officers in the Accounts.

By the Subdivisional officer you mean an officer in the Executive Department?—Yes. He hands the accounts to the Executive Engineer, and the accounts of the different subdivisions are then compiled by an officer who may be called the Divisional Accounts officer (he is an Accountant of the subordinate Accounts establishment), into the form in which they are sent in to the Examiner's office.

India.

P. W. Department.

Section III.

Lieutenant W. R. Hilliard.

The Hon'ble Mr. *Quinton*—contd.

Have you among your Native Accountants any who are fit to be promoted to superior grades?—There are certainly some very efficient Accountants among them; I will not go so far as to say that they would make equally good Examiners or be fit for promotion to Assistant Examinerships.

What are the several duties of the staff of an Examiner's office?—The Examiner is a controlling officer. When the accounts are received in his office they are handed over to the assistants of the Accountants, who compare the vouchers with the amounts entered in the different schedules of expenditure, &c. The figures taken from these schedules are all checked and entered up in the Examiner's books, from which he is enabled to keep on record the expenditure on any sub-head of work up to date. From the Checking Clerks the accounts go to an Accountant in charge of three or four divisions, who again checks them. From him they go to the Superintendent of the branch. He has to go over all the accounts of his section, and from him they go to the Deputy Examiner in charge of the branch, who is finally responsible for their correctness.

Have you been able to compare the work of the men recruited from the various sources you have enumerated?—No.

What is the difference between the duties of the superior and subordinate branches of the service respectively?—The difference is one of degree rather than of kind.

Then where is the difficulty in appointing from the subordinate to the superior establishment?—A man may be a very good subordinate and yet fail in a responsible position.

The Hon'ble Mr. *Quinton*—contd.

What are the duties of Honorary Assistant Examiners?—Some work as Deputy Examiners and general supervising officers.

What is the use of the grade?—It is something for the Accountants to look forward to.

Why not promote Superintendents to Accountantships?—They are Accountants already.

What is the object of having a distinction between them?—Superintendent is merely an office term.

Why should not Natives be appointed to the Examiners' grades?—I do not consider that the present stamp of Native that obtains in the Accounts Department is sufficiently well educated to be promoted to the superior grades; as far as I am aware, they do not come forward for the direct examination (*Appendix C, Public Works Code*), and the Accountant, or clerk, appointed on R60 per month, is certainly not fit to be promoted to be the financial adviser of a very large spending department on questions affecting not only works but individuals. It is difficult to obtain Europeans on R60 a month, the pay of an Accountant on probation. The most highly paid Native in our office draws R340 per month. We have no Native above the rank of Accountant, 2nd grade. Promotion is slow in this province; hence no senior Native will stay here if he can help it, when he may obtain his promotion to 1st grade in some other province or department of the Public Works Department, since Accountants are recruited for general and not local service. Clerks, on the contrary, whose pay varies from R350 to R30 per month, are appointed locally.

Witness No. XXXIII.—*20th April 1887.*

Pandit Prem Nath.

Examination of Pandit Prem Nath, Examiner of Accounts North-Western Railway.

The *President.*

I was educated at Lahore. I am a Cashmeri Brahman. I have been 20 years in the Department. I entered as Accountant in the lowest grade. I am the only Native of India who is an Examiner. I see no reason why this should be the case. The controlling work of the Department could certainly be done by some Natives. You would get better men in the Department if you opened these appointments to Natives. I do not consider a knowledge of Engineering is necessary for this Department. I have been twenty years in the Department, and have found no difficulty in understanding technical terms. The business of Examiner is chiefly administrative. He has to

The *President*—contd.

advise the Local Government in matters of expenditure and budget, and to examine the statements compiled in his own office with a view to find out that the results recorded are generally correct. I think a good general education and knowledge of accounts is all that is necessary for this. He also requires considerable tact in controlling the work of European officers. I have done this work myself on several occasions. I beg to suggest that Latin, French, or German in the list of subjects for examination for appointment in the superior Accounts Branch should be omitted, and Persian, Arabic, and Sanskrit substituted.

Witness No. XXXIV.—*20th April 1887.*

A. H. Ten Broeke, Esq.

Examination of A. H. Ten Broeke, Esq., Honorary Assistant Examiner, Accounts Branch.

The *President.*

My duties are so far different from those of Assistant Examiner in that I have subordinate work, such as auditing accounts, preparing statements, &c., to do as well. The Assistant Examiner passes the work which is done by other people. I might have to do that myself. After accounts are checked, they are sent up to the Assistant Examiner with such objections as there may be. A large proportion of his work consists in the annual inspection of divisional offices. The inspection of offices is for the purpose of seeing that the accounts on record in the Examiner's office tally with those in the Divisional office. I think the Accountants are, as a class, very hardly treated.

The *President*—contd.

The *President*—contd.

There is a ruling (Chapter II, paragraph 59) in the Public Works Department Code, that Deputy Examiners should be recruited from them, and this is very rarely done. I wish to point out that an Accountant of the first grade, on promotion to Deputy Examiner, second grade, might have to receive ₹50 to ₹100 less salary, for as an Accountant of the first grade he would draw ₹500 or ₹550.

WITNESS No. XXXV.—*26th April 1887.*

Examination of W. H. JOHNSON, ESQ., Executive Engineer, 1st grade.

W. H Johnson, Esq.

The *President.*

I was born and educated in England. My father had come to India to take contracts for the construction of railways, &c., and being desirous that I should follow the profession of an Engineer in India, he brought me to this country and sent me to Rurki to obtain my technical education. I passed the examination required to entitle me to study at the College, and went through the course there and obtained an Engineer's certificate. I was appointed Apprentice Engineer to the Public Works Department, and posted to the Punjab General Branch. I have been in that branch ever since, excepting from 1872-79, when I was in the Military Works branch.

I am now in charge of the Rawal Pindi Division. I have as Assistant or Executive Engineer been engaged in dock work in Calcutta, in the erection of barracks, and in the construction of hill roads in addition to the ordinary works of the branch.

I have had, as subordinates, Engineers educated at Cooper's Hill and also at Rurki, and I have met and known the work of a great many more of both classes, so that I am in a position to compare their capabilities.

Taking the best men of both classes I have found them very much on a par. The Engineering College at Rurki has always had for its Principal selected officers of the Royal Engineers, and therefore it would rather be a question of the capacity of the students to receive instruction than of the quality of the instruction offered.

The Rurki students have not as a body received so good a general education as the Cooper's Hill men. There is probably a greater difference in the average quality of the students who attend Rurki than those who attend Cooper's Hill so far as general education goes, and this explains the result of my experience that the percentage of indifferent men is larger among the Rurki men. I have had a fair number of purely Asiatic Native Engineers among my subordinates. As Assistants they do their work fairly well. I do not think they are to be compared with Europeans; they have not the energy, nor have they originality of Europeans to deal with unexpected difficulties or to devise means of overcoming obstacles with which they are not familiar, nor do I think they get on so well with their subordinates and workmen. They do not ordinarily secure the same obedience. I had some very good Punjabis under me, and for this province I consider them better qualified than Bengalis. On the frontier I would have as far as possible only Englishmen. The Natives are capital draftsmen, accountants, and clerks. For ordinary work I would rather have Native Engineers; they carry out orders more closely, but it is on works where difficulties may arise that the European is preferable.

The *President*—contd.

As to the Accounts Department. Once a year an Examiner or Deputy Examiner with an Accountant visits my office and thoroughly overhauls the accounts for the past year. The inspection is purely an inspection of accounts.

The accounts are submitted and monthly audited in the Examiner's office, and I think it is necessary that some one in that office should either be an Engineer or acquainted with Engineering knowledge to prevent frivolous objections which might be taken if there was no one in the office who had technical knowledge. As to the subordinate branch of the service, I feel it my duty to point out that the rule recently introduced prohibiting the promotion of men from the lower subordinate to the upper subordinate establishment works great and, I think, unnecessary hardship, and is inexpedient in the public interest. Many of the lower subordinates have the qualifications required for the upper subordinate establishment, and if promotion is altogether refused you will get an inferior class of men among the lower subordinates. Some degree of responsibility must be left to these men, and they are exposed to temptation. Their diligence and honesty are ensured by the hope of promotion to places of higher emoluments and position in the Department.

As to the furlough rules, there should, in my judgment, be no distinction between any class of Engineers, including Natives, when furlough is taken out of India.

As to pensioners, all classes of Engineers except those appointed in India without European training have lately obtained more favourable rules. It appears to me hard that the class I have mentioned should be excepted. I have served for nearly 20 years under the same rule as the other classes, having the same work and responsibility in every respect, and I consider it unfair that the same indulgence should not be extended to me as to others. My Assistant comes to me from Cooper's Hill to learn his work, and is under more favourable rules as to pension than I am.

Furthermore, as to pay. The controlling appointments in the Department being so few, the majority of the men must retire as 1st grade Executives. A man in from 3 to 5 years becomes a 1st grade Assistant on ₹500 a month. In the future he will have to serve for 25 years before he becomes an Executive Engineer of the 1st grade; he will then receive ₹950. This increase of ₹450 in 25 years is far less than the increase which is paid to other classes of public servants. I consider the pay should rise by annual increments of ₹50 per mensem in each year to ₹1,200.

There is a rule which entitles an Executive Engineer of the 1st grade to increment of ₹50 after 4 and an additional ₹50 after 8 years'

India.

P. W. Department.

Section III.

W. H. Johnson, Esq.

The *President*—contd.

service; but only on the condition that he foregoes further promotion. This condition appears to me to be unfair. If an officer is deserving he should receive both promotion and increase of pay.

I cannot say that at present these disadvantages have affected recruitment, because they are not generally known; but if the more favourable pension rules were required to attract men to the service, it follows that the disadvantages I have mentioned should be remedied.

The Hon'ble Mr. *Quinton*.

The bulk of the work in our Department is no doubt the ordinary supervision of existing works and the construction of small works, but as the Department is at present organised the Executive Engineer may be called upon at any time to submit designs or projects and supervise the carrying out of important works. If there was a special staff for such work, the ordinary work might be entrusted to officers who had good technical training, but were not specialists.

LETTER FROM MR. W. H. JOHNSON, Executive Engineer, P. W. D., TO THE PRESIDENT, SUB-COMMITTEE.

RAWAL PINDI, *25th April 1887*.

I have the pleasure to forward herewith the note you were good enough to ask me to draw out in support of the figures I stated in my evidence the other day, as to the salary and rank of an Engineer of the Public Works Department on retirement in future.

In my evidence before the Commission on the "Pension Regulations," I forgot to mention that should "officers appointed in India without English training" rise to the rank of Superintending Engineer, the Government of India has the option of granting them the new favourable pension rules; might I therefore ask the favour of your adding to my evidence the following :—

"Rule IV of Government of India Resolution No. 144 G. of 13th December 1884 is as follows :—

"IV.—In regard to Civil Engineers appointed in India from the Civil Engineering Colleges, or otherwise, and not included under III, who may rise to the rank of Superintending Engineer, the Government of India will be prepared to consider favourably their admission to the pension rules applicable to those included in Schedule B, I, II, and III (1). This rule is subject to any general restriction that may hereafter be prescribed as to the amount of pension payable to public servants who are Natives of India.

"Now this shows that it is intended to allow certain men to have the benefit of the better pension rules, and it is presumed that by limiting the privilege to Superintending Engineers it is intended that only those who have proved themselves good officers should so benefit. I submit, however, that the limit has been fixed too high, as very few men can possibly become Superintending Engineers, there being so few of them. The concession, therefore, in its present form is of little benefit.

"Only a good officer may reasonably expect to become a 1st grade Executive Engineer, so that if Government is determined to continue the distinction between men appointed in England and India, I would suggest that *men appointed in India who rise to be 1st Grade Executive Engineer* may be allowed the benefit of the new pension rules. This would preserve the distinction and at the same time allow of most good men benefiting by the new pension rules."

PUBLIC WORKS DEPARTMENT.

Showing the career the Engineers now joining the Department may expect under existing regulations.

The following table shows the strength of the Department Public Works (Bengal Presidency),—see Government Classified List of December 1886 :—

No. I.

Branches.	Chief Engineer and Government of India Secretariat.				Superintending Engineers.				Executive Engineers.					Assistant Engineers.			Total.
	Classes.			Total.	Classes.			Total.	Grades.				Total.	Grades.		Total.	
	I.	II.	III.		I.	II.	III.		I.	II.	III.	IV.		I.	II-III and Apprentices.		
Military Works—Railways—*Bengal*—North-Western Provinces and Oudh—Punjab—Local Administration	9	2	7	18	13	14	13	40	107	109	116	54	386	297	96	393	837

The casualties which have occurred in the Engineering Branch of the Public Works Department for the last six years from all sources (retirements, deaths, dismissals, &c.) are as given in the table below, and from these a fair average can be arrived at:—

Years.	Chief Engineers.			Superintending Engineers.			Executive Engineers.				Assistant Engineers.		Total.
	Classes.			Classes.			Grades.				Grades.		
	I.	II.	III.	I.	II.	III.	I.	II.	III.	IV.	I.	II-III and Apprentices.	
1881 . .	2	...	1	2	...	...	7	2	2	3	10	1	30
1882 . .	4	...	...	3	1	...	6	6	4	1	8	11	44
1883 . .	3	...	...	1	1	...	3	5	3	2	9	7	34
1884 . .	1	...	...	1	...	1	9	2	3	1	6	7	31
1885 . .	2	...	...	...	...	...	6	2	5	5	5	3	28
1886 . .	3	1	...	3	...	...	8	6	4	3	7	4	39
	17			13			98				78		206

Yearly average $= \frac{206}{6} = 34\frac{1}{3}$

Deduct on account of Royal Engineers reverted to the Home Establishment whose places are taken by others transferred to the Indian Establishment (these officers are shown in the Classified List as "casualties," but as their places are taken by others their reverting does not give promotion) 5

Total average yearly casualties . $29\frac{1}{3}$

Therefore there being 393 Assistant Engineers in the Department, and the average number of casualties yearly being $29\frac{1}{3}$, the time it will take the junior Assistant to become a 4th Grade Executive Engineer $= \frac{393}{29\frac{1}{3}}$ years $= 13\frac{1}{2}$.

Again, there being 279 IVth, IIIrd and IInd grade Executive Engineers, the further time it will take him to become a 1st grade Executive Engineer $= \frac{279}{18} \times$ years $= 15\frac{1}{2}$. Eighteen being the number of casualties yearly in the grades above Assistant Engineer, arrived at as follows:—

Casualties in six years (see table)	17+13	+98 = 128
„ „ one year	$\frac{128}{6} = 21\frac{1}{3}$	
Deduct for Royal Engineers reverted to Home Establishment as before .	$3\frac{1}{3}$	
	18	

That is, a man just joining the service will take $13\frac{1}{2}$ years in becoming a 4th grade Executive Engineer, and will take $15\frac{1}{2}$ years more to become a 1st grade Executive Engineer, or 29 years in all. Supposing that he enters the Department at 22 years of age, he will therefore be 22 + 29 = 51 years when he becomes a 1st grade Executive Engineer. He will then have only 4 years to serve in that grade before he is compulsorily retired at 55 years of age—service 33 years.

An Engineer's career may be taken to be as below in future:—

Enter at 22 years of age, 1st grade Assistant on R500 a month at 4 years' service.
Retire at 55, pay R950 a month, service 33 years.

The service of men who are now 1st grade Executive Engineers is in no way a guide to show the time it will take men now joining the Department to reach that grade. The Department until a few years ago has been a constantly expanding one, and consequently promotion in olden days was rapid. The Classified List clearly shows this. The ten senior men in the Department are—

Colonel Pemberton, R.E., who became a 1st grade Executive Engineer in				9	years.
„ R. Home, R.E.,	ditto	ditto	ditto	10	„
„ Filgate, R.E.,	ditto	ditto	ditto	8	„
„ S. T. Trevor, R.E.,	ditto	ditto	ditto	11	„
„ Perkins, R.E.,	ditto	ditto	ditto	$10\frac{1}{2}$	„
„ Lang, R.E.,	ditto	ditto	ditto	10	„
„ Forbes, R.E.,	ditto	ditto	ditto	10	„
„ McNeile, R.E.,	ditto	ditto	ditto	$12\frac{1}{2}$	„
„ Luard, R.E.,	ditto	ditto	ditto	13	„
„ Bonus, R.E.,	ditto	ditto	ditto	12	„
			Total	106	
			Average	10·6	years.

It took the present 1st grade Executive Engineers in the Punjab an average of 18 years to become 1st grade Engineers—nearly double the time of the men now at the head of the Department; and, as shown before, it will take the men now joining the Department 29 years to reach this grade under present regulations. The fact is the reorganisations lately made in the Public Works Department increased the pay of the lower grades, and altered the proportions of the grades, but no provision for a steady system of retirement has been made.

WITNESS No. XXXVI.—*26th April 1887.*

India.

P. W. Department.

Section III.

Col. P. Lambert, R.E.

Examination of COLONEL P. LAMBERT, R.E., Examiner, Accounts Branch, P. W. D., Punjab.

The *President.*

You are at the head of the Accounts Branch of the Public Works Department of this Province?—Yes.

Will you kindly tell us whether you consider it necessary that in this Department you should have Engineers as Auditors and Accountants?—I think the Engineers are very necessary in the Accounts Branch. They know the difficulties of Engineer officers in dealing with their accounts, and are able to audit their accounts in a much more sensible way than a mere Accountant.

Will you give us an instance of the difficulty which would be experienced by an officer unacquainted with Engineering work in dealing with the accounts of Engineers?—He would not know the difficulties of keeping a day-book, for instance, nor appreciate the difficulty which the Executive Engineer has in looking over the mass of initial accounts. The initial accounts do not go to the Auditor.

Why is it necessary that the Auditor should possess a knowledge of the difficulties you refer to?—Because he would know the difficulties which attend the compilation of the accounts in the divisional office.

How is that necessary for the purpose of audit?—Whenever the accounts of a division are audited there is made out a document called the Audit Remarks which deals with all the imperfections in the accounts. My idea is that an officer who has been accustomed to executive work would be able to eliminate a great many of those remarks which only irritate the executive officer without doing any good.

After the Accountant had examined two or three offices, would he not have become familiar with the difficulties you speak of?—I do not know about that. In an inspection you do not see very much of the real work.

An officer after having once taken the objections which you characterised as likely to irritate, and having had them explained to him, would not be likely to repeat them unnecessarily?—He might not see the necessity for not repeating them if he did not understand the difficulties in the actual working of a division office. I do not think that from merely seeing the accounts of the division office he would be able to judge.

You have under you, I believe, two Deputy Examiners and two Assistants?—Yes.

The Hon'ble Mr. *Quinton.*

Are there not many Examiners in the Accounts Branch who are not professional Engineers?—Yes.

The *President.*

What are the duties of Mr. A.?—He is a Deputy Examiner in charge of one of the branches of the office, either the Irrigation or the General Branch, or perhaps of more than one branch.

His duty is to audit the accounts of the office?—To supervise the office. The audit is done by the Accountants and Clerks.

The *President*—contd.

Would he also be deputed to examine offices?—Yes; the gentleman I refer to is not an Engineer. He does his work very well.

By whom is the inspection work discharged now in this Province?—By myself and my two Deputies. It is not the rule to send Accountants out on inspection duty. A proposal was made a short time ago to have the accounts in the Deputy Commissioner's office, which relate to public works, inspected by our office. For such work as that I should send an Accountant. We get accounts of provincial and local expenditure from the Deputy Commissioners. The Deputy Commissioner has a man in his office called an Accountant. He has nothing to do with our Department, but, as I said, a proposal has been made that our office should inspect his work, and I think it would be a very good rule if an Accountant were sent now and then, because he can explain things much more readily.

Who audits the accounts of the Deputy Commissioner's office?—I have an Accountant in charge of that branch. The expenditure in that office under public works is audited by us. For such work as that an Accountant would be employed.

Is the Deputy Commissioner responsible for the correctness of those accounts?—Yes; he signs the accounts, and any objections that are taken are addressed to him.

Do you wish to make any observations as to the present constitution of the Department?—No.

The Hon'ble Mr. *Quinton.*

Do you see any objection to the promotion of Natives, who have done well as Accountants, to the higher grades of the Department?—They might be made Assistant or even Deputy Examiners; but I do not think they are fit to be in charge of a large office. They would not have sufficient authority; they would have to deal with so many different kinds of officers; if they had only to deal with Natives it would be another thing. I do not know of many Native Accountants who would be fit to be Deputy Examiner. There is one in my office who would make a good Deputy Examiner; he is a very intelligent man.

The *President.*

Is it not rather a waste of professional knowledge to employ Royal Engineers in the lower grades of this branch of the Department?—I think that for three or four years it is a very good training for them. My idea is that they should go into the accounts for a certain time and then go back to executive work.

Cannot the whole accounts system be learned by an intelligent man in six months?—I do not know that he could acquire a really efficient knowledge of accounts in six months. As a subdivisional officer he has very simple accounts to do,—merely the making up of the initial accounts.

It has been suggested that an officer with the high attainments of an officer of the Royal Engineers could be employed more profitably to the coun-

The *President*—contd.

try on works of construction than on the business of account?—That is very true.

It has also been suggested that officers in the Royal Engineers, who are retained in the Civil Department of the Government of India in order to render their services available in the event of warlike operations, would gain a more thorough knowledge of the country and more valuable experience of the Engineering work of the country if they were employed in the Engineering rather than the Accounts branch?—That is perfectly true. I do not think a Royal Engineer officer should remain in the Accounts or be considered as an Accounts officer, but I consider it is a very good training for him. I think it would save a great deal of trouble to the Examiners.

Is it not desirable that every Engineer officer should have passed a certain period of training in the Accounts Department?—I am not prepared to say that, because it would involve a great many changes. I would not, of course, confine the training to Royal Engineers. The duties of an Accounts officer are not confined to mere duties of accounts. All kinds of questions are referred to the Examiner for information.

The *President*—contd.

Are these questions simply questions arising upon rules framed by the Public Works Department?—A great many of them are connected with the Financial Department. There are questions constantly arising with reference to pensions, leave, &c., which we have to deal with. No doubt the pension and leave rules are all laid down in the pension and leave codes, but still questions as to the correct reading of these codes are frequently referred to us.

Is the Examiner at all consulted by the Local Government as to the cost of works?—No.

Or of schemes?—No.

Has it ever been the custom in this Province for the head of the Administration to seek the advice of the Examiner as an Engineer officer?—I have only been here a short time and my predecessor was not an Engineer officer at all. He was an uncovenanted civilian.

Sittings at Simla.

WITNESS No. XXXVII.—*5th May 1887.*

Examination of BRIGADIER-GENERAL J. BROWNE, C.B., C.S.I., R.E., Engineer-in-Chief, Sind-Pishin State Railway.

Brigadier-General J. Browne, R.E.

The *President*.

When did you enter the service?—I have been in India nearly twenty-eight years, during which period my service has been entirely in the Punjab and on the frontier, excepting a few months in the Central Provinces and at Rurki College.

You are now Engineer-in-Chief in charge of the Sindh-Pishin Railway?—Yes.

In the course of your service you have had, I presume, under you gentlemen belonging to all the classes from which the Engineering Department is recruited?—Yes.

Will you kindly give the Commission your opinion as regards the comparative merits of Cooper's Hill and Rurki Engineers?—The Cooper's Hill men are usually taken from a higher stratum of society, and the professional education imparted at Cooper's Hill is certainly higher than that given at Rurki.

You yourself were at one time Assistant Principal of the Rurki College?—I was; and I know a good deal about the College. As a rule I think the Rurki men are superior to the Cooper's Hill men in one very important particular,—that is to say, they have much more precise ideas of discipline, and carry out orders with a precision and readiness which is wanting in Cooper's Hill men, speaking generally. It is a very weak point in the Cooper's Hill men that they do not obey orders unhesitatingly as they might do and as the Rurki men undoubtedly do.

To what do you attribute this?—I think it is very much owing to the fact that the Rurki College was at its commencement to a certain extent on a military basis, and also to the fact that the Rurki men are largely recruited from the sons of old soldiers and men of that class. At all events

The *President*—contd.

it is in my experience a fact that the Rurki man can as a rule be more trusted to do exactly what he is told than the Cooper's Hill man.

Having regard to the results of their technical education, which, as a class, do you consider to be superior?—I have said that I do not think the Rurki men have had the advantage of so high a technical education as the Cooper's Hill men. On the other hand, they have a great advantage over the Cooper's Hill men at starting in possessing a much greater knowledge of the country, the language and the habits of the people, at an earlier age than the Cooper's Hill men could have. In special branches of Engineering, such as irrigation, and where you have to deal with matters which are not purely Engineering matters, such as revenue matters, I am inclined to think that the Rurki man understands the Natives better.

But as regards their technical education as shown in their after-work, do you consider that the best Rurki men are equal to the best Cooper's Hill men?—I think that, taking them all round, the best of both classes are very fairly equal.

And comparing the average Rurki men with the average Cooper's Hill men, which do you consider are the better as regards technical education?—The Cooper's Hill man is the more scientific Engineer and the Rurki man is in many respects the better what we call *bandobust* man in his general dealings with the Natives. I will mention a case in point. I have had a good deal to do with the supply of provisions to workmen, which is often a very important matter and quite apart from Engineering capacity. In a matter of this kind a Rurki man will as a rule do much better than a Cooper's Hill man,—at least I have

India.

P. W. Department.

Section III.

Brigadier-General J. Browne, R.E.

The *President*—contd.

always found it so. He knows how to set about it better.

What has been your experience of Natives of Asiatic parentage as Engineers?—I have never yet met a Native Engineer in the gazetted grade that was of any real use, with one exception who is well known in the Punjab. I have met a few good office men amongst gazetted Native Engineers, but no competent working Engineers.

As regards Natives in the subordinate establishments, what is your opinion?—There are first-rate men amongst them—a different class altogether from the educated Native gazetted officers. They are as a rule men who have risen from the Mistry class, and amongst them we sometimes find really clever Engineers and very able men in many ways. I have had many of them under me, who have been of enormous assistance to me, very plucky fellows, men who have got what I call a mechanical eye, in which as a rule Native college-trained Engineers are most hopelessly deficient—I mean men who will look at a scaffolding and judge for themselves whether it will tumble down or not. I have met numbers of Natives of this class who have the capacity of at once seeing and saying that a thing is right or wrong without caring in the least about what technical or mathematical books may say about it. I have myself been put right time after time by men of this class who are very valuable.

Do you now speak of men from the Punjab only?—All those I have known were Punjabis with one exception who was a Mahratta Brahman. This man had quite a genius for girder erection, the sort of thing a sailor is good at,—*i.e.*, lifting heavy weights; but the rest were entirely Punjabis. I do not mean to say that all Punjabis are necessarily better than others, but simply that I have always worked in the Punjab and with Punjabis.

The Hon'ble Mr. *Quinton.*

Was this Mahratta Brahman an educated man?—Not a highly-educated man. He could just speak, read, and write English, but he was not a college man in any sense of the word. He was entirely self-educated.

The *President.*

In what branches of the Public Works Department do you consider it most desirable to employ Royal Engineers?—I should say it is most undesirable that they should be employed in the Accounts Branch. If there is anything in the world likely to make a bad Royal Engineer officer, it is putting him into the Accounts Branch, as the whole tendency of such employment is to make him utterly useless on war service. I dare say Royal Engineer officers make good Accountants; but looking to the efficiency of the army it is most disastrous so to employ them, and every Royal Engineer Officer entering the Accounts Branch should, *ipso facto*, be considered as having given up all claim to military service and employment. He should be permanently seconded exactly as he would be in England, and another officer put in his place. He should be considered to be, what he really is, a pure civilian, by his own choice.

The *President*—contd.

We were told by a witness in the Punjab, himself a Royal Engineer, that in his opinion it was desirable that Royal Engineers should be as much as possible employed on the frontier instead of in the Accounts Branch of the Department. What is your opinion?—I think it is most desirable to employ Royal Engineer officers on the frontier, and most disastrous to the efficiency of the army to allow any Royal Engineer officers at all to serve in the Accounts, which wastes their military education, and must spoil them as Engineer soldiers.

Colonel *Pemberton.*

In what respects do you consider that Natives as Engineers are wanting?—I have had as Executive Engineers many Babus under me on the Punjab Frontier. They were absolutely and utterly useless. I have had many cases of men of this class simply refusing to go into dangerous districts, exhorting me not to bring their fathers' gray hairs with sorrow to the grave when they were told to go outside Kohat for instance. There is no question that in such districts they would have been in greater danger than Europeans. They would not have been in their proper element, nor would it have been right to send them there.

The *President.*

Is it desirable that as far as possible we should have Royal Engineers on the frontier in preference to other Engineers?—Most unquestionably it is, and not only that, but I should most strongly recommend that the whole of the military roads and railways on the Indian frontiers should, as far as possible and in every possible way, be handed over bodily to the Military Works for the training of Royal Engineer officers. At present to my mind the military works, except in Beluchistan, are not a very good school for Military Engineers; whereas frontier railways and roads are an excellent school. Looking to the efficiency of the army, I would say let Royal Engineers be given as much opportunity as possible of making railways and roads and public works of all kinds and sorts on our frontiers under conditions approximating as nearly as possible to the conditions of actual warfare. A Military Engineer's first business on service is to make bricks without straw; and frontier service is the best school to teach him to do work, roughly perhaps, but in time to be useful to the army to which he is attached.

It has been suggested that the Government might content itself with the employment of less skilful Engineers in the divisions, reserving a special body of Engineers for extraordinary works, such as the erection of large buildings and the construction of new railways—as it were, a sort of *corps d'élite* at headquarters, composed of the very best men,—and men of less advanced technical knowledge in the districts?—I think that system has been tried already to a certain extent when they had a special Military Works, and separated the repairing of barracks from fortifications and so on. That was in 1870, and I think the result of it was—the usual result of *corps d'élite*—that it lowered the whole standard of the service all round. A man thought himself badly treated if he was excluded from the *corps*

The *President*—contd.

d'élite, and to a great extent degenerated. I should say also that by putting inferior men into the districts we should find it said again that it was advisable to have them under civil and district officers' control, which to my mind would end in much waste of money and very bad work, the usual result of having ignorant Engineers controlled by amateur Engineers.

Then you consider the suggestion advisable neither on the ground of economy nor efficiency?—Yes.

Do you consider it desirable that even the best Engineers in India, men who come out here or receive in India the best technical education, should have the practical knowledge of detail which is acquired by an officer in a division?—I go very much further than that in some respects. I think that if we want really efficient Engineers and efficient Accounts management—by which I mean not having prettier forms, but better and more work for your money—the best we could do would be to oblige every officer during his service as an Assistant Engineer, however great his technical ability may be, and however high the degrees he may have taken, to go through what I call a regular course of downright hard drudgery. At present it is a weak point with the young men who come out here, that they think it drudgery to lay out and measure their works and to pay for them with their own hands. The disinclination to such drudgery I believe to be the most fruitful source of bad work and fraud in the whole Department.

This so-called drudgery gives young officers an amount of knowledge and practical experience which all the technical college education could never give them and would not be labour wasted. I have a case in point. When the Lahore and Peshawar road had been started, for many years it was popularly supposed to be a perfect sink of corruption and robbery, until a gentleman took over charge who insisted on every cash-book being signed at the bottom by every gazetted officer, certifying upon honour that he had made every payment himself and every measurement in that cash-book with his own hands; and within about a year this system worked the most wonderful reform on the whole road; an immense amount of corruption was detected. The men even who were trained in this system knew more of practical work than nine men out of ten who had received a much higher technical education. That is my recipe for cheap and good work in the Department—to insist on none but gazetted officers making payments or measurements; to insist upon their keeping their cash-books in their own hand; and to absolutely prohibit all measurements or payments through the agency of subordinates.

Do you think it necessary that officers in the Accounts Branch of the Public Works should possess technical knowledge,—that is, is it necessary that they should be Engineers altogether or to a considerable extent? Suppose you yourself were going to reconstruct the Department, the Department having to do not only with the audit and supervision of accounts and with large projects, but also the constant supervision of ordinary public works, would you employ in the Department only men who were Civil Accountants and not Civil Engineers, or would you have a percentage of Engineers, or would you have all the Accountants Engineers?—As matters now stand, I think the Public Works Accounts Branch might very fairly be divided into two branches for regulation works and for non-regulation works, just as the Government of India made up their minds to have different laws for regulation and for non-regulation provinces. For a certain class of works to which the present accounts system is fairly applicable, such as military works where you have lists of works all carefully estimated for and all arranged in order of urgency, and where you can foresee for perhaps three years exactly what is likely to happen, and also of course for civil works such as provincial works and kutcherries, market-places, &c., I do not think you require skilled Engineers in the Accounts. But in more important works, such as great roads, railways, and canals,—in what I would call non-regulation works,—the assistance of Engineers must be called in, in keeping the accounts, or the unskilled Accountants make the most astounding blunders of all kinds from sheer want of comprehension of ordinary engineering details. For example, it is a fact that came under my notice that a roadway girder, worth about ₹60 and lost in a flood, was charged as a whole girder span worth ₹25,000, and was for months gravely debited to a bridge, till an Engineer looked at the accounts and detected at a glance a bungle which an army of Accountants would never have found out.

A complaint has been made that already there are too many Engineers in the Accounts Branch?—I think mere Accountants are quite good enough for a certain class of works. But where you get what I call non-regulation works, in which I class practically all railways, canals, and large projects, my inclination would be to insist upon every Assistant Engineer going through a regular course of drudgery as an Accounts officer to his Executive Engineer. I would keep a sort of roster according to which an Assistant Engineer at some time of his service would have to be an Accounts Assistant Engineer to a division. I would oblige him to keep the cash-book in the fullest detail and hold him responsible for every detail in that cash-book having been entered in the minutest particulars and for every allocation which was wrong or obscure. Where you have heavy works, if you have a mere Accountant, probably away from the works and allocating the charges and trying to see what the works cost, without any personal or technical knowledge of the works, you may be certain that serious blunders will be committed. My inclination would be to oblige Assistant Engineers to put in a certain time of their service as Accounts Assistants to their Executive Engineers, and, if that system did not act, I would make each Assistant Engineer keep his own cash-book in the fullest detail.

How would you audit these accounts?—That would be perfectly easy, and once the allocations were correctly shown in the cash-book, could be done by the ordinary staff of the Accounts Branch without any fear of these gigantic bungles which are constantly being committed in the case of big works, and which are due to the utter inability of the existing class of Accountants from downright ignorance of works to see the absurdities of many of their charges.

India.

P. W. Department.

Section III.

Brigadier-General J. Browne, R.E.

Colonel *Pemberton.*

You tell us you would wish frontier railways to be constructed almost entirely by the Military Works. Where is the necessity for this?—The chief necessity lies in the fact that, nowadays, of the Royal Engineer officers who are put on to railways, the best and keenest soldiers must want to go on service. As at present the Military Works Department has practically got the monopoly of going on service, the Royal Engineers serving on railways have a very fair idea that in all probability, in the event of a campaign, they would be left behind. When the latest Russian scare took place in 1885, I was distinctly told that neither myself nor any one of the some fifteen Royal Engineer officers I had with me on the frontier railways need apply for active service as they would not be allowed to go.

Would there have been no difficulty at all had the railway been under the Military Works Department? Could the men have been spared even in that case?—Officers of the Military Works having entered a Military Department, can fairly claim first choice to be allowed to go on active service as having sacrificed the benefits of the Railway Branch, which is a purely Civil Department. The Military Works Department is worked by the Inspector-General, who is under the Commander-in-Chief in many respects, and has the selection of officers for active service when required; theoretically and practically also the Inspector-General is under the orders of the Military Member of Council. Both the Commander-in-Chief and the Military Member of Council being soldiers would not hesitate to let a railway take care of itself if the services of a Royal Engineeer officer were considered necessary on active service elsewhere, or more likely to be valuable in the field rather than on the railway. On the other hand, Royal Engineer officers in the Railway Branch might have to apply for leave to go on service to a civilian superior, which to their minds is of course a very great drawback. The civilian superior does not care at all whether the man goes on service or not, he cares nothing for the military requirements, and would probably refuse to forward any application to go on service as it would interfere with his civilian work on the railway.

The Hon'ble Mr. *Quinton.*

Would not the Inspector-General of Military Works say exactly the same?—No.

Colonel *Pemberton.*

In the last Afghan War was it not constantly the case that a number of military officers were withdrawn from other than military works?—Yes, but only *en dernier ressort;* the Railway and Irrigation men were sent last into the field, not first as they would have wished. The impression rightly or wrongly is, that the effect of being employed under the Public Works is to minimise your chances of going on service. Further, the promotion on railways for Royal Engineer officers is so bad that, seeing themselves superseded every day by their contemporaries in the Military Works, they object to service on the Railway Branch altogether as meaning supersession, although quite aware that it is, taken all round, perhaps a better school for Engineer soldiers than the Military Works. They feel themselves being rapidly superseded both in their civilian and their military position, neither being pleasant.

Colonel *Pemberton*—contd.

Is not this question of Assistant Engineers personally seeing to the payment of their men a matter which is entirely dependent on the Engineer-in-Chief of a division or the Executive Engineer whether it shall be done or not?—It is within his power, but at the same time it is so utterly objected to, and so distasteful to young hands, that unless made a universal rule the Engineer who imposes the duty on his Assistant lays himself open to considerable unpopularity.

The Hon'ble Mr. *Quinton.*

With your present establishments would you have enough men to do it?—Possibly not on very large works, but the amount of saving that would result from the system would easily compensate for the establishment being doubled, and not only doubled in cost but also in efficiency. The very fact of having to measure works himself means that a man would sit at his work much longer than he would dream of doing otherwise. He would have a vastly closer knowledge of his work than he now possesses.

Colonel *Pemberton.*

Surely the allocation of charges ought not to rest with the Accountant at all?—The Executive Engineer leaves it to him to a great extent when he has a lot of work to do. He has got an Accountant, and he is obliged to trust him, though he knows he is very often unfit to do the work. Efficient Accountants are so scarce that I have known drunken, useless, and admittedly bad Accountants kept for months in a division after the Executive Engineer has reported that they were utterly unfit and dangerous to trust.

Is it possible for any Accountant however highly trained, to allocate expenditure unless he gets the documents correct from the Assistant or the Executive Engineer?—If the work is incorrectly entered on the work voucher, or if it is not entered there at all, it is quite beyond his power to allocate that expenditure; and that is why I want to have Assistant Engineers whose business it would be to allocate and pay. The fact is the existing class of Accountants are so badly trained and so ignorant that they make the most incredible blunders for no reason whatever, even when the allocations are carefully and fully shown by the Engineers. What happens when the Engineer under press of work gives allocations that are not perhaps quite clear, but which are Hebrew to a badly-trained or drunken Accountant, can be better imagined than described.

Is it not at the present time the business of every Executive Engineer to allocate expenditure?—That is the theory, but in practice there is an Accountant who is supposed to do it and does it. There are of course faults on both sides, but if a man is at all fit to be an Accountant you naturally give him credit for that which his education in fact does not warrant. What really happens is this: The Examiners seem to get hold of the best men in their own Accounts office, and to send all their worst men to the Engineer's office, and that is why they get the accounts in such a muddle from the Engineer's office. They ought to

Colonel *Pemberton*—contd.

send their very best men to the Executive Engineers, and then they would get the accounts in such a state that even a fool could not make a mess of them.

The *President.*

Then you would have the inferior class of men to check as well as compile the accounts? Is there any system of check in the Examiner's office? None that I know of. It is altogether a paper check; and I am strongly of opinion that the whole system of Public Works Accounts, as a check on dishonesty or fraud, is an elaborate and most costly farce; and that for half the money a real check could be maintained, which would not worry the executive officers half as much and oblige them to waste much of their time on what every practical working Engineer knows to be in many cases merely reasoning in a vicious circle and assuming that accounts are really and substantially correct because the sums of vertical figures agree with the sums of horizontal figures, which is an average Accountant's idea of correct accounts.

The Hon'ble Mr. *Quinton.*

There is no guarantee that the amount of work shown on the paper has actually been done?—Not the faintest attempt at such a guarantee. Within the last twenty-seven years since I have been in the Public Works I have seen many cases of embezzlement brought home, but I have never yet seen a single case brought home through the operation of the Accounts Branch. It was done entirely either by the Executive Engineers, or, more frequently, by the thieves quarrelling among themselves over the division of the plunder.

How long is it since you left the Provincial Branch?—Since 1878. I was then a Superintending Engineer in Biluchistan. In 1882 I was a short time in the Bengal Provincial works.

Is it not the case that the bulk of the works executed by the Buildings and Roads Branch are of a very petty character?—As a rule. In my time, however, it was not so. The provincial works I have been employed on were some of the heaviest in the Punjab,—for example, the Kangra Valley roads. I think the great drawback of the military works at present is, that you may have a man employed on the military works in a cantonment who practically never goes out of the cantonment; whereas if he is taught provincial work he gets a knowledge of the country and how to make use of the resources of the country, and he also comes to know the people.

Do you think that Rurki Engineers, employed in that way, would be equally efficient when employed on military works without having gained that experience?—I have had a great many Rurki Engineers under me on military works, and they did exceedingly well. One great point in their favour is that when a Rurki man goes into a cantonment, he, as a rule, does not quarrel with the Military authorities; whereas other Civil Engineers often get into hot water with the Military authorities.

The *President.*

Is it advisable to promote men from the upper subordinate to the gazetted appointments?—In very special cases I would do so. I think that the class of Native I have mentioned as having what I call a great mechanical eye and good engineering talent, though otherwise good men, are not men whom, as a rule, I would trust with large sums of money. Their morality is of the kind which exists amongst the less educated class of Natives, and I believe that they themselves would be perfectly content with getting rapid and, what is more important still, special promotion for special good works. By this I mean a distinct understanding that they have something to gain in special promotion by doing good work. As matters stand, a man may work his heart out and be told that so and so, a well-known lazy subordinate, has a prior claim to promotion when a vacancy occurs, because, however lazy, he happens to have served longer in the Department.

Do you not frequently find European soldiers who have taken their discharge entering the Public Works Department in the upper subordinate branch?—Yes. And I think that men of that class, if men of sense, are generally very content with having reached the top of the upper subordinates' grade. My experience, however is not very favourable to the military subordinates as a class. Some are first-rate men, others give a deal of trouble.

The Hon'ble Mr. *Quinton.*

In what, generally speaking, do they fail?—I should not say they fail; but there are many circumstances in which the European subordinate compares unfavourably with the Native, and specially is this so on rough frontier work. He needs more looking after than the Native; and if he is married and brings his wife with him, it creates difficulty, especially in frontier work, in providing her with quarters. You have to spend a great deal of money in putting her up; you must build a house for her, because you cannot allow a European woman to live in the open. On the other hand, if he comes without his wife and family if he has one, he is very often apt to drink: having no sort of society I quite understand it. He has nothing but his work to think of, and he is put to great temptations. I am speaking now of my own experience. I have met some very good European non-commissioned officers, but I know it is very hard on them to be sent to places where they are exposed to grievous temptations alone with their thoughts.

The *President.*

Is it desirable to retain this Honorary Assistant Engineer rank?—I think it is. It is a distinct honour, I think. Of course I cannot interpret the state of their feelings in the matter, but it is certainly my impression that the honorary rank is looked upon as an honour, and I personally feel great respect for any man who attains it. Practically the Honorary Assistant has the same powers as the Assistant Engineer.

But he has not the same status?—His status depends very much on himself. I have known men who from having been Sergeants of Sappers rose to the actual command of regiments, and others

India.

P. W. Department.

Section III.

Brigadier-General J. Browne, R.E.

The *President*—contd.

who became Assistant Engineers and Honorary Assistant Engineers while their rank went on in the army, and they were gentlemen and treated as such in every respect. I see no particular objection to making them Assistant Engineers without the invidious title of Honorary, although I, personally, would interpret the title honorary as being rather *pour le merite* rather than in any derogatory sense.

Is there not this distinction, that as ordinary Assistant Engineers they are promoted by mere seniority, whereas as Honorary Assistant Engineers it is supposed that, unless they again show exceptional merit, they will not be promoted further?—Yes; but I think that is a bit of an anachronism, and as regards the army it is dying out. If a man shows himself fit for the very highest position, no one should grudge him that position.

Colonel *Pemberton.*

Are there not men in the Department who have risen from the upper subordinates' grade to tolerably high positions?—There are, I should think, a good many, but I cannot recall their names.

WITNESS No. XXXVIII.—*9th May 1887.*

Henry Irwin, Esq.

Examination of HENRY IRWIN, ESQ., Superintending Engineer, Simla Imperial Circle.

The *President.*

I believe you were appointed to this Department from service under the Ceylon Government?—I was. Before that I had been employed by the Admiralty in England. Since I joined the Department I have served in the Godavery district, the Nagpur, Saugor, Hoshangabad, and Nerbudda divisions. The Godavery is a navigation district; the rest are roads and buildings divisions. In 1881 I was transferred to Simla Imperial Circle.

Have you had many Rurki men serving under you?—Yes; two were immediately under me.

Have you had any Engineers under you who were educated at Bombay, Madras, or Seebpore Colleges?—No. I have known other Rurki men besides those I mentioned, but not immediately under me.

What is your opinion of them as Engineers?—The two young men I refer to were very well educated and very useful young fellows.

Did you consider they had sufficient technical education for service in this country?—As Assistant Engineers certainly.

Were they qualified to rise higher than that?—Not when I knew them; but they gave promise of becoming so.

You considered that the training they had received was reasonably good?—So far as book-knowledge went. They had had no practical Engineering training before they joined the Department.

Did they soon acquire sufficient experience to be available for duty?—I think so. One of them was extremely useful to me, immediately after he joined, in the construction of a ghât road.

Have you had Cooper's Hill men serving under you?—A good many.

What is your opinion of them?—They are, I think, extremely well educated men and promise to do well.

Comparing the men you have met from Cooper's Hill and Rurki, which do you consider on the whole the better as a class?—I think the Cooper's Hill men are more likely to be useful in the Department and to take a higher place. They are more likely to prove a better class of men for the higher appointments.

The *President*—contd.

In what respect were the Cooper's Hill men you have known superior to the Rurki men of your acquaintance?—I think their technical education was better, and I think they showed a greater knowledge of their work even when they first joined.

Comparing the best men of the two classes do you notice any difference in them?—The two Rurki men I have referred to were superior to some Cooper's Hill men. I think some of the men who joined from Cooper's Hill would have done better in other professions. I do not mean to say that they were deficient in education, but their tastes lay in another direction. The same remark would apply to some Rurki men also. I have known one or two of the latter who were quite useless as Engineers.

Have you had any Asiatic Natives serving under you?—I have had one Native Assistant Engineer under me. He had been educated at Rurki.

Is he one of the two Rurki men you have spoken of?—No; I had forgotten him when I spoke of them. They were Europeans. He is the only Native Engineer I have known, and therefore I would rather not offer an opinion about Native Engineers as a class.

Is it, do you think, advisable to promote from the upper subordinate to the Engineer establishment?—Only in very exceptional cases.

What is your opinion of Natives in the upper subordinate establishment?—I have known them both good and bad.

Which do you consider the best in the upper subordinate grades—Natives or Europeans?—Europeans.

Why do you think so?—I place more reliance on them. I think also that they can acquire a better knowledge of what is required in Engineering.

Have you met any thoroughly-competent Native subordinates?—Oh yes.

In what respect were the Europeans superior?—I place more reliance on them.

Do you mean they are more ready of resource or more trustworthy generally?—I mean trustworthy generally, and I think also more full of resource. In cases of sudden accidents to works Europeans would, I fancy, show themselves the better men.

The *President*—contd.

Do you know anything of the Accounts Branch of the Department?—I have never had anything to do in the Accounts office.

The Hon'ble Mr. *Quinton.*

Are not the accounts of your division prepared in your office?—The rule is that the Accountant compiles them from the initial accounts in the subdivisional office.

Under whose control is the Accountant?—He is accountable to the Examiner for the submission of the accounts.

Colonel *Pemberton.*

If he were in doubt he would refer to you?—Oh yes.

The *President.*

Is he a member of the Accounts Department?—He is under the Accountant-General.

He is only attached, as it were, to your office?—Yes.

The Hon'ble Mr. *Quinton.*

Is he under your orders?—Yes. He is like a subdivisional officer. He is a subdivisional officer in charge of accounts.

The *President.*

He is under your control in making up the accounts of your office, but is responsible for his work to the Accounts office?—Yes.

The Hon'ble Mr. *Quinton.*

In what respect is he under your control?—He has to attend the office, and I expect him to obey me and give me any information which is necessary in connection with the accounts; and I should expect him, before he charged things off to different sub-heads, to refer to me in case there was any doubt. Of course these things are guided by rules in most cases, but there are certain charges—for instance, a charge for lime manufacture and the like—which may be charged off to work or to stock, and it would be for me to decide which it should be.

Is it necessary that an Accountant or an Examiner of Accounts in this Department should have a knowledge of Engineering?—Not an atom of professional knowledge is required of him that I know. I do not think he ought to have anything to do with the checking of Engineering work.

The *President.*

Ought he not to have some knowledge of Engineering terms?—I do not think it is necessary.

Your divisional accounts are examined periodically; are they not?—Yes.

Is it necessary that the officer who examines these divisional accounts should have technical knowledge?—No.

The *President*—contd.

Have you any suggestions to make regarding the recruitment of the Department?—I wish to say that a man who joins the Department from Rurki, Cooper's Hill, or any of the colleges, ought not to be considered on the same footing as the man who, before joining the Department, has not only gone through a term of study at an Engineering school, but has also served an apprenticeship in the actual work of his profession.

Is there any ground for the complaint that the Rurki men have not the same opportunity of learning the higher branches of their profession as the Cooper's Hill men, because while the latter are employed on large works under resident Engineers, the Rurki men, owing to their knowledge of the language, are employed on small district works?—That is not my experience. On the contrary, of the two men that I have mentioned as having been sent to me from Rurki, one was put on the works here, and the other was employed on a ghât road, both important branches of work. The other man I mentioned was employed on railways, when railways were first started by the Public Works Department.

Colonel *Pemberton.*

With reference to a previous remark of yours, is it not the case that men who have been brought out from England after having had practical experience of Engineering, have been appointed direct to the first grade of Assistants or even higher?—Yes. What I meant to infer was that I did not think the system of appointing direct from colleges was a good one; and that if Government intended to employ men from England it would find it more economical to appoint men who have had a practical training in England. At present Government is paying men who are only learning their profession.

The *President.*

Which do you think exercise the most efficient control over their workpeople, the European or the Native subordinates?—I think there is not much to choose between them. A man if he is a professional hand, if he has been a working foreman, a foreman mason or carpenter, will, I think, organise his work better than a non-professional such as many Native subordinates are. With a few exceptions the most useful upper subordinates I know are men who have been taken from trades—carpenter and blacksmith mistries. Those are the men I would make Sub-Overseers; but I would never give them subdivisional charges, as is often done and is a great mistake. By having subdivisional charge I mean they have so much cash intrusted to them to expend on labour. It is very difficult to manage otherwise, and yet it gives a great deal of trouble. That at least is my experience.

WITNESS No. XXXIX.—*9th May 1887.*

Examination of COLONEL ROBERT HOME, C.I.E., R.E., Deputy Secretary to Government of India, Public Works Department, and Inspector-General of Irrigation. *Col. R Home, R.E.*

The *President.*

I believe you joined the Department in 1856, in the Irrigation Branch?—Yes. I have served throughout in the Irrigation Department. I joined the Department in the North-Western Provinces, and

The *President*—contd.

was subsequently transferred to the Punjab and have remained there ever since. I am now Deputy Secretary to Government and Inspector-General of Irrigation.

India.

P. W. Department.

Section III.

Col. R. Home, R.E.

The *President*—contd.

Have you had under you Native as well as European Engineers?—I have had Native Engineers under me.

Have you seen enough of their work to be able to express an opinion regarding their work as a class?—I have never employed them as other than subdivisional officers, and in that capacity they did their work on the whole very fairly indeed. We had a little difficulty in getting them to move about. They were not so active as Europeans.

In other respects did they do their work as well as Europeans?—Oh dear, no. They required much more detailed instructions and orders, but that I think was to be expected.

And they were more fearful of responsibility?—They would not accept any responsibility. We were asked some years ago to see if we could not replace Assistant Engineers by subordinates, and in one or two instances in the North-Western Provinces it was done with considerable success. I issued a circular in the Punjab accordingly, and men were selected and specially trained with a view to see whether we could not put them in charge of Revenue subdivisions where there was not much construction work to do, and where the work would be mainly repairs, maintenance and distribution of water, &c. But we have been singularly unsuccessful. We never succeeded in getting men who were able to do the work as we considered it should be done. The men we selected were upper subordinates, and very sharp men they were too.

In what respect did they fail?—I do not think the zemindars respected them in the way they would respect Europeans. They did not take their orders; would not obey them. The zemindars in the Punjab are very independent people, and subdivisional officers should be persons they can look up to. I do not think they did look up to these men.

Were these subordinates themselves Punjabis?—Yes.

Never Bengalis?—We never dreamt of employing Bengalis; we knew *they* would not do. Up to the present time we have not been able to find a single man who was fit for the work.

Do you find the upper subordinates efficient men in their proper functions?—Decidedly so. In fact, except on construction works, we very rarely employ Europeans as subordinates.

Have you had under you both Engineers educated at Rurki and Cooper's Hill?—Yes.

Can you express an opinion as to the relative merits of the two classes?—Well, I think the good men of either class are about equal. I see no great difference between them when you do get good men of both classes. Of course we have many more Cooper's Hill than Rurki men, so that it is not easy to compare the two classes; but I have had some very good men of both classes. I have in my mind now a Rurki man whom I considered to be one of the best Executive Engineers I ever had. He was decidedly the best man I had at the time for the work I had to do,—that is to say, for the administrative work of canals,—though I dare say better men could have been found for construction work and perhaps with greater professional knowledge.

The *President*—contd.

Comparing the general education of the two classes, what is your opinion?—I consider the Cooper's Hill men superior as a body. Their professional training is decidedly better.

And their general education also?—Yes.

We have been told that the Rurki men are of more immediate use to the Government?—They must be so. They start with a better acquaintance with the resources of the country, the language and the habits of the people.

And having regard to their better knowledge in that respect, do you consider the Rurki men on the whole as serviceable to the State as the Cooper's Hill men?—I think so.

And likely to continue so throughout their careers?—That I cannot say, as I have never seen either Rurki or Cooper's Hill men in high administrative posts, but in executive posts I think they are.

Would it be possible, without any loss of efficiency, to increase the number of appointments made in India, or decrease the number of those made from England?—That I cannot say. You have to look at something more than executive qualifications; you have to consider what a man will be when he gets an administrative appointment?

The Hon'ble Mr. *Quinton*.

From your experience of both classes, can you say which you think likely to turn out the best Superintending or Chief Engineers?—I consider the Cooper's Hill men likely to make better practical Engineers. I think they are better trained for it. Of course it is important that a Superintending Engineer should be a good practical Engineer as well as a good administrative officer. I should expect Cooper's Hill men to shine more as Superintending Engineers; it is difficult to say, though, because a man may have a natural turn for administrative work no matter where he has been educated; but still a Cooper's Hill man has the best general education. I would not say that no Rurki man would succeed as an administrative officer; but I think a Cooper's Hill man more likely to do so, and I consider the Royal Engineers better than either. I have no doubt about that; the Royal Engineers are very picked men, the cream of a service.

Would you promote from the upper subordinate to the Engineer establishment?—No. We have had several instances of such promotion. The men were old men when I knew them and they were serving under me, and I looked upon them all as failures.

As they advance in years do Europeans or Natives exhibit the greatest powers of endurance?—I have had Europeans under me, and they always seemed to work to the last.

We have been told that in some kinds of work a Native breaks down sooner than a European?—I have noticed no difference in the endurance of either class. My experience, however, is entirely confined to Natives of the Punjab.

You have had, I believe, a good deal to do with the Accounts Branch of the Public Works Department?—Yes.

The *President.*

Is it desirable that we should have Royal Engineers in the Accounts Branch, or would you prefer to utilize their services in branches of the Department requiring more technical knowledge?—That is a rather difficult question, and one which I have not considered.

It has been suggested to us that we ought as far as possible to employ our Royal Engineers on the frontier, so that they may acquire a thorough knowledge of the country; and that they are more suitable for employment there than one or two of the Bengali Engineers who are now employed there?—I have not formed any opinion on that point.

The Hon'ble Mr. *Quinton.*

I believe you have held the post of Executive Engineer for years?—Yes.

You had, as such, a certain control over the accounts of your division?—I had to render them.

And an Accountant was placed at your disposal for that purpose?—Yes.

So that you saw what the system was?—Yes, from top to bottom.

Do you consider that to be an efficient Examiner in the Accounts Branch of this Department a man must have had a training as Engineer?—I should think not. At the same time I do not see how an Examiner can be competent to pick holes in an Executive Engineer's accounts unless he has some general knowledge of Engineering. Of course he has always the Superintending Engineer to help him when he is in doubt; but I have known cases where a non-Engineer Examiner got himself into trouble by finding fault without ground.

Colonel *Pemberton.*

Do you not think that a man who has risen from Assistant Examiner to Examiner will ordinarily have sufficient knowledge to avoid making mistakes?—Yes; unless, as they sometimes do, they go into details and items, and then they invariably, I think, get into a mess.

The Hon'ble Mr. *Quinton.*

May not the mistake you allude to have been caused by the Examiner overstepping his province?—I cannot say what an Examiner's proper province is. It is what he likes to make it.

The Hon'ble Mr. *Quinton*—contd.

The *President.*

You consider that as a rule an Engineer's training is not necessary to make an efficient Examiner, but that some general knowledge of Engineering is desirable?—Most desirable.

Would it be sufficient if we had in the Accounts Branch of the Public Works Department a certain number of Engineer officers?—Yes: officers who have practical experience of Engineering.

Is it desirable, generally, that the head of the Accounts Branch of this Department should be an officer with an Engineer's training and experience?—I think it would add to his usefulness very much if he had that training and experience. I think a man who has not had any practical experience goes a great deal too much by his books, his papers, and his forms. He does not appreciate the necessities of work, when he should let such and such things slide, or when he should tighten the reins.

Colonel *Pemberton.*

If you took a man from the Civil Accounts Department and made him an Examiner in the Public Works Accounts, he probably would not be a success?—Most certainly he would not. An Examiner has a great deal in his discretion; he can slack reins when he likes, he can tighten them when he likes; and I do not see how he is to do it if he is absolutely destitute of Engineering knowledge.

The Hon'ble Mr. *Quinton.*

Have you not in the Accounts branch of this Department some very efficient non-professional Examiners?—Yes; only the other day I had one in the Punjab, and we got on wonderfully well for a long time; but at the end of his service he got into trouble in trying to force too much paper on us. He was adding to the returns and making things more stringent. It was entirely an individual case.

Have you any suggestion to make as regards the constitution of the Department?—I only desire to say that, having always endeavoured to employ Natives whenever I could, I have found that I could only do so up to a certain point. By Natives I mean pure Asiatics.

WITNESS No. XL.—*9th May 1887.*

Examination of R. B. BUCKLEY, ESQ., M.I.C.E., M.I.M.E., Under-Secretary, Government of India, Irrigation Branch, Public Works Department. *R.B. Buckley, Esq.*

The *President.*

You are a member of the Institute of Civil Engineers and of the Institute of Mechanical Engineers?—Yes.

And you were a Whitworth scholar?—Yes, I was one of the first batch.

You were engaged by the Secretary of State for employment in this country under the Stanley rules?—Yes.

You joined the Public Works Department in 1869?—Yes. As a Whitworth scholar, I was bound to be employed in mechanical work, and accordingly I was sent to the Dehri Workshops. The Dehri Workshops are large workshops in the Sone Irrigation works. On leaving the Dehri Workshops I was posted to the Buxar Division, where I was some two or three years, and then was transferred to another division of the Sone Circle. I subsequently acted as Engineer to the Calcutta Corporation for several months. I was Executive Engineer in charge of the Circular and Eastern Navigation Canals near Calcutta. In 1883 I

The *President*—contd.

India.

P. W. Department. Section III.

R.B. Buckley, Esq.

The *President*—contd.

officiated as Under-Secretary to the Government of India for about eighteen months, and I returned to Simla about a month ago as substantive holder of that appointment.

Have you had Natives of pure Asiatic parentage serving under you?—I have had two or three and I have seen the work of others.

What do you think of the fitness of Natives for employment in the superior grades of the Public Works Department?—That is rather a difficult question to answer. I think that Natives are thoroughly competent for many appointments in the superior branches of the Public Works; but I think the ability of Natives does not rise, as a rule, to the point which is really required for what I call purely Engineering works. I mean to say that Natives are excellent when the work they have to do is merely imitative, but that they fail in what I call higher Engineering work,—that is to say in origination, invention, and design. When a certain work has been done in a certain style with which they are conversant, they are, in many cases, quite as good, and in some cases better than Europeans.

Comparing the Native and European Engineers you have known who were educated at Rurki and Seebpore, which as a class do you consider the better?—I should not myself draw much distinction between Natives and Europeans educated in these colleges,—that is to say, Natives and Europeans who are ordinarily called Civil Engineers. As regards Mechanical Engineering work, to which Seebpore is to a considerable extent devoted, there can be no question whatever that Natives fail. The educated Hindu has very little or no mechanical aptitude. There is mechanical aptitude in the country, but the class of Natives who go to Seebpore and Rurki Colleges have not got it.

Comparing Rurki with Cooper's Hill men, which do you consider the better as a class?—There can be no question that the Cooper's Hill men are better as a class, though we have had some very good men indeed from Rurki.

Comparing the best men from Rurki and Cooper's Hill, which do you consider the better?—The Cooper's Hill men undoubtedly. They are more highly educated to begin with, and they have the great advantage of an English training which certainly gives a higher tone to their character. Altogether, and as a rule, they are men of a better class and standing—a fact which gives them a better position in society, and moral assistance in enforcing their orders and doing their duty to Government.

The question is whether India must import what talent she requires?—If you want the highest talent you must import it; you will rarely get it here.

Do you consider that our Engineering Colleges in India are capable of educating men sufficiently to perform the ordinary duties of Executive Engineers?—Yes; some of those duties, not all. The ordinary duties of an Executive Engineer extend to those higher duties to which I have said Natives cannot rise.

Do these colleges impart such an education as to provide us with competent Engineers?—For the less scientific work they do.

The *President*—contd.

At the present moment the rate of recruitment is six Royal, fifteen Cooper's Hill, and nine locally educated Engineers. Do you consider that the proportion of appointments assigned to the Indian Colleges might be increased?—Assuming of course that you retain the establishment on somewhat the same lines, I should say it might.

Do you find Natives and Europeans in the upper subordinate establishment fairly competent for their work?—Certainly.

Would you promote from that establishment to the Engineer grade?—Most certainly not, for several reasons. To begin with, I am opposed to the maintenance of such a large staff of Engineers as we have now. I think that much of the work which is now done by Assistant and Executive Engineers could be as well done by men of an inferior standard of education. The Engineers should be a *corps d'élite*—not men who are merely competent to execute works. There is a great deal of difference between the two. You can find in this country Natives who are excellent for executing work; and if you reduce your Engineers in the higher establishment, and increase the establishment of what may more properly be called executive men—men of construction only,—you could then recruit a much larger number of Natives than you do.

Do you think Natives can be trusted on works of construction without supervision?—No. I do not think anyone can be trusted without supervision.

You say you would have more of the purely executive work performed by Natives who are not Engineers?—By Engineers I mean men who are capable of executing the highest technical work. We have many men now in the superior grades of the Department who are capable of doing such work and who are employed on works for which Engineering skill is not required. You can increase the number of men who would be competent to do such work, and decrease the number of men who are competent to perform the higher class of work. At present you get out a large staff of men from England who are competent to do the higher work and who are kept from doing that work, and have to do work which might be done by inferior men.

Would it not be necessary to supervise even the work which you say inferior men are capable of doing,?—Not very closely. You get very good work as a rule with a fair amount of supervision.

You are aware that the several Engineering works in this country have been failures owing to want of supervision,—the Saugor barracks, the Allahabad barracks, the Allahabad Gun Factory, for instance?—I am aware of that, and I fancy I could give you quite as long a list of failures that have happened at home, beginning with the Tay bridge. On the other hand, I have seen some old work at Delhi which I doubt you could equal now. All that was done by Natives and it is most excellent work. I do not think it has yet been shown that Natives cannot do good work.

Colonel *Pemberton.*

What kind of work do you refer to as being done by Engineers when it might just as well be done

Colonel *Pemberton*—contd.

by subordinates?—The ordinary subdivisional charges in executive divisions. You keep a Cooper's Hill man 15 years in subdivisional charges, in the manufacturing of bricks and lime and the putting of bricks and lime together—no doubt a class of work which it is necessary he should know how to do well, but which it is not necessary he should be 15 years doing.

The *President*.

You say that since the reorganization of the Department it is possible that a man may be fifteen years an Executive Engineer?—Not only is it possible, but I believe it was contemplated he should be so. I consider that by doing so you actually weaken a man's capacity for superior work. I could name you several Executive Engineers of the fourth grade who are in charge of divisions.

How would you remedy this state of things?—By diminishing the superior establishment.

And recruiting fewer men for it?—Decidedly.

In what way have you been employed as Mechanical Engineer?—I was in a mechanical workshop at home for five or six years.

How has your mechanical ability been utilized in this country?—I was three or four years in the Dehri workshops, six months or so in the Seebpore workshops, and what mechanical ability I had would have been more or less utilized in my work there.

What class of Europeans do you get at Seebpore?—All classes, I think, of Indian-bred Europeans.

Were some of them promising lads?—Yes, and some of them have, I believe, done very well in private enterprise.

And the Natives?—Natives of the class who go to the Indian colleges will not, as I said before, take kindly to mechanical work. They have become mostly Overseers in the Department, contractors, and so on.

Do you think it is necessary that professional Engineers should be employed in the Accounts Branch of the Department?—Certainly not.

Do you consider it necessary that they should be as numerous in this branch of the Department as they are now?—I do not. I do not think Engineering knowledge is at all required in the Accounts Branch.

Is it not desirable to have some practical Engineers in this branch of the Department, to whom

The *President*—contd.

reference may be made in doubtful cases?—It may be desirable in the sense that all experience in connection with matters of that kind may be of assistance.

Is it desirable to have Royal Engineers in the Accounts Branch of the Public Works Department?—No.

Or would not the country get better value for its money by employing Natives in that branch of the Department and utilizing the services of its Military Engineers elsewhere?—There can be no question that Bengalis make most excellent Accountants, but whether they are fit to rise to the highest functions of the Accounts Branch is another thing.

Colonel *Pemberton*.

Is there not this advantage in having persons with technical experience in the Accounts Branch, that they are able to treat the accounts of the Engineers more intelligently?—It might have a tendency in that direction.

The Hon'ble Mr. *Quinton*.

Do you think that the advantage which Colonel Pemberton has pointed out is worth paying for at the rate it is paid for?—No, I do not.

Nor under the two-thirds rule applicable to Natives of India?—Obviously it is cheaper to employ men on two-thirds, but I think such a course is open to serious objection. I think that if you employ men to perform certain duties and grade them in certain classes and ranks with other men performing the same duties, you mark them out as equal to those others, and therefore you ought to give them equal remuneration. The same objection applies also to the distinction which is made in the pay of Royal and Civil Engineers in the Department; it is an inequality which ought to be adjusted. There is no reason why you should not pay every man in the same grade, Native or European, equally so long as you have some means by which the fittest man shall always be promoted.

Colonel *Pemberton*.

If you knew that you must pay the same price for every one, would you not in the interests of the Department prefer to get all your men from home?—You do not pay the same price for all. You should eliminate the less efficient and pay the best men well.

WITNESS No. XLI.—*9th May 1887*.

Examination of H. P. BURT, ESQ., C.E., Executive Engineer.

H. P. Burt, Esq.

The *President*.

You received your technical training at Cooper's Hill?—Yes.

When did you join the Indian Public Works Department?—In September 1878. I had previously undergone a period of special training in England. It was after my appointment to the Department. I was posted to the London and North-Western Railway. On my arrival in India I was posted to the Rajputana State Railway. I was nearly four years there working on different

The *President*—contd.

parts of the line, and then I was transferred to the office of Director-General of Railways in November 1884.

Are you acquainted with the system of technical education practised at Rurki in the Engineering classes?—No.

So that you cannot compare it with the class of instruction you yourself have received?—I have seen the syllabus from time to time, and it

India.

P. W. Department.

Section III.

H. P. Burt, Esq.

The *President*—contd.

struck me as not being so advanced as that of Cooper's Hill.

Have you ever worked with Engineers from Rurki?—Not on railways.

Have you met any Engineers of pure Asiatic parentage?—I have met them, but have never worked with them.

Have you been at all in a position to judge of their ability?—No.

You have had both Natives and Europeans serving under you in the upper subordinate establishment?—Yes.

Do you consider it advisable to promote from the upper subordinate to the Engineer establishment?—No. I do not think that the men so promoted would command the confidence of their subordinates. I consider they are already sufficiently rewarded by getting the honorary rank. Even now, in the absence of sufficient Assistant Engineers,

The *President*—contd.

they are given subdivisional charge, and they are occasionally so employed before they get the honorary rank.

Have you any suggestion to make about the future recruitment of the Department?—No. I think the present system is satisfactory.

Would you alter the proportion of appointments now assigned to Cooper's Hill and the Indian colleges?—I would not. I think there is an advantage in having the selection a mixed one.

How many students are there on an average each year at Cooper's Hill?—There are about one hundred and forty in every three years' course. From forty to fifty go out every year.

From what class do the men who accept Indian appointments generally come?—As a rule the men who come out here are amongst the first of those on the list.

WITNESS No. XLII.—*7th May 1887.*

Col. A. J. Filgate, R.E.

Examination of COLONEL *A. J.* FILGATE, R.E., Accountant-General, Public Works Department.

The *President.*

How long have you been in the Department?—About twenty-four years. When I first came to India about twenty-eight years ago I belonged to the Madras Establishment, and as there were no vacancies in the Public Works Department, I was attached to the Department without any office in it. I did not actually join the Department until some four years later. I was then the only Public Works officer in the South Kanara district. I afterwards joined the Accounts Branch of the service and have been in it ever since.

Have you had any experience of the Engineers obtained under the "Stanley" rules?—No.

Or from Cooper's Hill?—None that would enable me to speak definitely on the point.

Have you had any experience of Natives as Engineers?—No.

Then you do not desire to give an opinion as to the relative merits of the different classes of Engineers in the Department?—No evidence I might give on that head would be of any value.

Is it desirable that the officers in the Accounts Branch of the Public Works Department should include gentlemen possessing a technical knowledge of Engineering?—Such knowledge is useful but not essential.

Is it in any case desirable that the Accounts Branch of the Public Works Department should contain a certain leaven of officers possessing that knowledge?—I think it is. Otherwise we could not officer the Department.

Why not?—At present the Accounts Branch of the Department is officered by Royal and Civil Engineers who have been transferred from the executive branch, from men who have been promoted from the rank of Accountant, and from men who have passed a certain test examination before admission. These last are men who have failed to gain admission into other services and have come to us as a last resort.

The *President*—contd.

Are these men appointed by nomination or by competition?—By nomination subject to a test examination which you will find in the Public Works Code, Volume I, Appendix C. They enter as Apprentices and are all Europeans.

Has it ever been the practice to advertise the competition so as to admit of any one coming forward to compete who chose to do so?—No. The candidates for the test examination are nominated, but the nomination gives them no claim to appointment.

The Hon'ble Mr. *Quinton.*

By what principle are you guided in making the nominations?—By the principle of getting the best men we can.

The *President.*

You know that applications are constantly made for employment in other branches of the public service. To what do you attribute this absence of applications for appointments in this Department?—I cannot say.

Are not the salaries paid in this Department somewhat higher than those that are paid in the General Accounts Department?—On the contrary they are distinctly lower.

We have been informed in the course of our enquiry that the salaries paid in this Department were higher than those paid to men in the Civil Accounts Department for similar work?—On the contrary the pay of an officer in the Civil Accounts Department is much the higher.

The Hon'ble Mr. *Quinton.*

Comparing them with those of officers in the graded list in the Financial Department, are the salaries in the Public Works Department lower?—Distinctly so.

The *President.*

I see you have a Deputy Accountant-General and four classes of Examiners, and three grades in the last class of Deputy and Assistant Examiners. What work do the Deputy and Assistant Examiners do?—The Deputy Examiners in large provincial offices are as a rule employed to take charge of certain branches, and also they have to inspect all the Executive Engineers' offices.

Is there any difference in the work of Examiners and Deputy Examiners?—There is this difference, that the Examiner is, as a rule, the head of an office and has deputies under him.

In the Accountant-General's Department, I understand that the first work done is the comparing of accounts with vouchers?—Yes.

That work is generally done by Accountants, is it not?—Yes.

The work of these Accountants is tested by certain officers in the enrolled department?—Yes.

Is the system the same in your department?—Practically it is.

All the Examiners, then, of whatever grade, have very similar duties?—The difference is in the extent of their charges.

The Hon'ble Mr. *Quinton.*

The most extensive charges being given to the highest-paid officers?—As a rule.

The *President.*

You say that, as a rule, the salaries of the Examiners are fixed with reference to the importance of their charge?—Yes, and the exceptions to this rule are the result of an unwillingness to make frequent transfers from one office to another, apart from the charge of offices.

Do Deputy Examiners perform the same class of work as Examiners?—Yes.

Have you any Asiatic Natives at all in the graded service?—There is one among the Examiners of the 4th class. He owed his promotion to the fact of his being a specially good Accountant. We have any quantity of Natives among the Accountants.

It does not appear that you have ever appointed a Native directly to the superior branch of the Accounts Department?—No; and I do not think I could recommend it. I should like to see whether he had an aptitude for the work before I appointed him.

Yet you bring in young Englishmen whose qualifications have not been previously ascertained?—Yes; they suit us best.

The Hon'ble Mr. *Quinton.*

Why do you think that?—One of the chief duties of an Examiner is to go round and inspect the Executive Engineers' offices; and such duty could not, I think, be satisfactorily performed by a Native. Many of these Executive Engineers would take umbrage at a Native being sent to examine his office.

Are there no Native Executive Engineers?—Yes.

The Hon'ble Mr. *Quinton*—contd.

Surely they would not object to their offices being examined by Natives?—They would not like it so well.

The *President.*

Have you many Royal Engineers at present in the Accounts Branch of the Department?—No; we have about a dozen altogether.

What is the object of having them at all?—Because without them we might find it difficult to man the Department; and another reason is that there is no employment for them elsewhere.

We have been told that there are Engineer appointments on the frontier now held by Natives whom it is expedient to replace by Europeans, and that it is far more desirable to have our Royal Engineers on the frontier than in the Accounts office. What is your opinion?—I quite understand that Royal Engineers are more fitted to serve on the frontier than Natives would be.

Might not the Natives be transferred to the Accounts Department?—If they knew anything about the work.

The Hon'ble Mr. *Quinton.*

How many Royal Engineers have entered the Department of late years?—There was one in 1865, one in 1867, one in 1874, one in 1876, two in 1878, one in 1879, two in 1884, two in 1885, and one in 1887. The one who entered in 1885 had been removed from frontier employment because his health utterly broke down. The one who entered in 1884 came in from the Sappers and Miners, chiefly because he could not get employment in the Public Works Department. I cannot tell you why. The one who entered in 1887 came out from England and joined the Military Works. The Military Works could not find employment for him, nor could the Public Works either. I did not select the men; they were sent to me.

Had the man who joined in 1887 done good work?—Very good work.

In what grade did he enter the Department?—He has the rank corresponding to that which he held in the Public Works. He superseded no one, because he was brought in in the rank corresponding to that which he held in the Public Works Department, in the place of a gentleman who, a month previously, had been transferred to the Military Works Branch.

Had he any experience of accounts?—No, but he had experience of Secretariat duties, having been for many years Assistant Secretary in Hyderabad, which was a good training for office work. Our work is not all accounts work; we act as financial advisers to the Local Governments in the Public Works.

Does not the responsibility for the expenditure of money rest with the Secretary of the Public Works Department?—The actual responsibility does, but the Secretary must know how the grants are disposed of.

Does he not refer to you only in order to ascertain the state of the accounts for the year—what funds are available, &c.? You do not advise in

The Hon'ble Mr. *Quinton*.—contd.

any other sense than as a banker would his customer or an agent his principal?—We have to estimate his liabilities also.

You mean that you apprise the Government of what sums have been voted already out of its budget rates, and also what permanent charges there are which will absorb them?—Yes, and that is a very important matter.

I understand that when you make up your budget for the year, each division estimates the amount it is likely to spend?—Yes.

And you assign to it either what is asked or a less amount?—Yes.

May there not be some works which may be called extraordinary, which do not come into the ordinary division budget?—They all come into the budget.

When a Local Government asks what funds are available, all you have to see is what funds are already pledged or have been released?—Quite so. There is an allotment made to each division for its work.

How does your Department differ from the Civil Accounts Department?—Our duties are not merely those of Accountants. We are financial advisers to Government in the Public Works Department. The work of an Examiner in looking after expenditure is more difficult than the corresponding duty of an officer in the Civil Accounts Branch.

Wherein does the difficulty consist?—In this, that the Civil Accounts expenditure is, as a rule, more or less a fixed quantity which repeats itself almost yearly. In the Public Works, we never have the same job to do two years consecutively. Each year the whole thing is re-cast. One year we may have to spend half a million on a railway and only ₹20,000 in the next year, and *vice versâ*.

Colonel *Pemberton*.

Do you not find that a great deal of trouble is occasioned by transfers of funds owing to changes in the policy of Government?—Yes; our work is very much more complicated altogether.

Does not the Secretary of the Public Works Department do the financing?—Yes. I myself was Deputy Secretary for that purpose. The Accountant-General is *ex officio* Deputy Secretary to the Government of India in the Public Works Department, and as such would be consulted by the Secretary in all questions connected with finance or accounts. The budgets here are practically made by the Accounts officers.

Are they not made by the officers in charge of divisions?—The officers in charge of divisions send up their demands. Those demands are cut down in the Secretary's office and the budget is compiled by the Examiners altogether. The compilation may be done by anybody. The Accountant-General in the Public Works is consulted all along as to how the money should be appropriated.

How can an officer in the Accounts Branch know what stores are required for a particular railway? To know whether the stores are supplied he must be the officer who is working on the railway?—Certainly. A lot of stores are ordered against the grant assigned for this year. If those stores are

Colonel *Pemberton*—contd.

paid for this year they are placed against that grant. If they are not supplied and paid for within the year, the grant lapses and is gone, and the stores come under the grant of the next year.

Is not the surplus available for the next year?—No. I do not say these are difficulties which require technical knowledge, but I say that work in the Civil Accounts is much more simple than in the Military Accounts.

I believe you have several civilians in the superior grades of your service?—The bulk of them are civilians.

Comparing the Military and Civil officers in this branch of the Department, do you find any difference as regards their work?—It is difficult to say. I have got some civilians who are equally as good as the bulk of the military men, but as a rule the military men are above the average in the Department. Latterly we have had a considerable number of Cooper's Hill men coming in, who promise to do exceedingly well.

Comparing the work of the military men, the Cooper's Hill men, and of the men recruited in this country, which would you call the most efficient public servants?—On the whole I should say the men we have got in the Public Works Department are the best we have. We have got a few very good men from outside, but on the whole the Public Works men are the best. They pull better with the officers.

But as regards their ability for doing the work of the Department?—On the whole they are the best men we have got as Accountants. We have some uncommonly good men among the civilians, but taking the average it is as I say.

How do you account for that, seeing that they have no experience of accounts before they enter the Department?—The accounts are not a very difficult subject to master, and the men from the Public Works are able to turn to account a better education and better ability on the whole.

The Hon'ble Mr. *Quinton*.

Do you recommend any change in the present method of recruitment?—I should like to raise the test for the men we get from outside. It is not sufficiently high to guarantee us good men. I want to get men of a higher standard.

Do you find that men are deterred from entering the Department by the fact that they must pass an examination?—I get very few applications.

Is it not because it is pretty generally known that there is no use in applying?—No.

What is the average number of vacancies in each year?—It varies very much. There were five appointments in 1885 and none in 1886. Latterly we have been taking as many men as we could from the executive branch in order to relieve that branch of its surplus officers, and the consequence is that there are fewer vacancies for outsiders.

The *President*.

Do you not think that if you gave public notice of vacancies in the Department requiring to be filled, you would have a sufficient number of applicants to make an effectual competition?—My opinion is that we ought as much as possible to obtain our men from the executive branch.

The *President*—contd.

Is it not the case that, by your system of exchange from one Department to another, the natural flow of promotion in your Department is disturbed?—In this Department there has always been a fair flow of promotion.

I believe you occasionally promote men from the subordinate to the superior grades of the Department?—Yes.

Do you see any objection to doing that more freely than you have done heretofore?—I would not like to promote more men from the subordinate ranks than we do promote at present; we only take selected men.

Colonel *Pemberton.*

Do you consider that a man may be a first-class Accountant and yet not be fitted to be a Deputy Examiner?—Yes.

The *President.*

What is the nature of the work done by superior officers in the subordinate Accounts establishment?—They are in charge of sections. Some keep the books, and some of them make audits or superintend the making of audits.

At present outsiders are admitted to the subordinate establishment by open competition?—Yes. Practically every one may go up for the entrance test. There are four classes of men from whom we recruit for the subordinate Accounts establishment: (1) outsiders, (2) men already in the Government service, who are admitted without test, (3) men in the upper subordinate executive branch, and (4) men who have passed the Engineer test of the Thomason College; they also are exempted from the test examination.

Have you any competition for employ in this Department?—No. There is only a pass test. The appointments in the minor administrations and railways are practically made by me; appointments in the larger administrations are made by the Local Governments.

Do you see any objection to the introduction of competition?—None whatever.

At present you nominate a man and send him up for examination?—They are examined by hundreds every year.

The Hon'ble Mr. *Quinton.*

Does the examination alone decide a candidate's fitness?—I know that an Examiner in Bengal used to take a number of men into his office as probationers without pay, and, after a short time, he used to examine them and give us the best of them according to the results of the examination.

Colonel *Pemberton.*

I suppose if a man has not got the ear of the Examiner, he has very little chance of getting into his office at all?—That is so.

The *President.*

What is the pay of Accountants in your Department?—Accountants of the first grade get from R350 to R450; those in the second grade, from R250 to R340; in the third grade they get from R160 to R240; in the fourth grade R80 to R150, and as probationers they get R60. In Madras the pay of the lowest grade was from R30 to R75.

What pay does a Royal Engineer get as an Examiner, in the first class for instance?—All the Royal Engineers serving in the Accounts establishment receive what is called their net military pay in addition to the pay of their grade, just as in the Public Works Department.

Do you not think that Royal Engineers—the most perfectly educated Engineers in the world—should be employed rather on works than in accounts?—If you have work for them.

What is the object of having out twenty-five men a year if we have no work for them?—There are about four hundred Royal Engineers on the Indian establishment whom we have to pay for. Last year we asked and obtained the concession that no more should be sent out at present, but we had to pay for them all the same, as they were on the Indian establishment.

Have any recommendations in respect of this Department been made by the Finance Commission?—No.

How is that?—Because the subject was not taken up.

Do you consider it possible in course of time to make a considerable reduction in the cost of this establishment by employing labour locally recruited?—Yes, if we can get the local labour for reduced pay; and I think there would not be much danger to the Department's efficiency if the change were made gradually, so as to educate a set of men in the Department. At the same time I should always recommend, for reasons which I have already expressed, the retention in this Department of a certain number of men recruited from the class who now mainly fill the upper grades of the Department,—that is to say, they would provide financial advisers to Government and prevent the friction between this and the executive departments which might otherwise arise. Of course you cannot put men in these important charges unless they have experience of accounts; but a good executive officer who pays attention to his accounts would, in my judgment, be quite competent to take charge of a province as Examiner after a very short probation. The Cooper's Hill men who enter the Department pass all the departmental examinations in about a year, while men who enter the Department at the bottom take two or three years to pass these examinations, and can barely scrape through them.

You have a system of departmental examination after probation?—Yes.

Are those departmental examinations essential, or should they be passed before the candidates are appointed?—A man has no opportunity of acquiring the knowledge required for passing departmental examinations except in the Department. He might get his knowledge from books, but he would have no practical knowledge.

Is there any rule which requires the passing of these examinations within a certain time, and if so, is the rule strictly enforced?—A rule has been recently made for this very purpose and will be strictly enforced. We have had two or three very bad instances of men who failed at every

India.

P. W. Department.

Section III.

Col. Filgate, R. E.

The *President*—contd.

ation and would not learn the work. Most of them were men who had come out from England to find employment in India.

The Hon'ble Mr. *Quinton.*

You have been twenty-four years in the Department and can therefore say whether it is a fact that Natives were formerly more largely employed in the Public Works Department than they are now?—That is not the case; and I believe that the only Native we have in the superior service is the only Native who has ever held a superior appointment in the Department.

WITNESS No. XLIII.—*7th May 1887.*

R. G. Macdonald, Esq.

Examination of R. G. MACDONALD, ESQ., Examiner, 2nd class, and Deputy Accountant-General.

The *President.*

When did you come to this country?—I was born in England, and came to India between the ages of nineteen and twenty to seek employment. That was in 1863. I obtained an appointment in the subordinate Accounts establishment in 1863 and have since passed through the several grades of that branch of the Department. I am now 2nd class Examiner and Deputy Accountant-General after nineteen years' service in the superior and four years' service in the inferior grades.

Do you consider that for service in this Department it is requisite that a man should possess a knowledge of Engineering?—I do not; but I think it is an advantage. I recognised this early in my own career and took care to pick up information about the works. I certainly think that a man cannot intelligently perform his work as an Examiner unless he understands Engineering to a certain extent. At the same time I think he can acquire that knowledge without necessarily undergoing an Engineer's training.

You have served with both Europeans and Natives in the Department?—Yes.

Do you consider that Natives might be more largely employed in the superior grades?—I think they might.

Comparing the European and Native Accountants you have known, which, as a class, do you consider the better?—I have known excellent men of both classes. By Natives I mean Natives of pure Asiatic origin. Most of those we have to do with are Natives of India in the statutory sense, and I do not think I could draw any sharp distinction between them and the European Accountants.

It has been suggested to us that Natives have a peculiar talent for accounts. Have you found it so yourself?—I have not found that they possessed greater talent in this respect than Europeans.

Do they bestow more care on their work?—No. I have found that they fudged when a European told me the truth.

Do you think that well-educated Eurasians, domiciled Europeans, and pure Asiatic Natives show as much ability in the discharge of their duties of Accountants in the Public Works Department as Europeans do?—I think they do.

Do you consider it desirable that promotions should occasionally be made from the subordinate to the superior grades of the Department?—I do,

The *President*—contd.

in exceptional cases. I may say that of the twenty-one men I have known who were promoted from the subordinate to the superior grade, twenty have in my judgment done the Government excellent service. Twenty-one is just about the number of such men in the Department at this moment. I may also mention that about the time I joined the service, and afterwards also, it was not unusual for men to enter the subordinate grades as a kind of apprenticeship for the higher service.

Is it desirable that men should serve this apprenticeship?—I do not mean to say they should in all cases be required to pass through the Accountant grade in order to arrive at the superior appointments.

Then you say that while in certain cases you would promote from the subordinate to the superior grades, as a rule you would not do so?—Yes; such promotion should be for exceptional services as commissions are sometimes given in the army to private soldiers for good service.

Have you ever compared the salaries drawn by men in the Accounts Branch of your Department with those drawn by men in the General Accounts Department?—Yes; and my opinion is that we are very much the worse paid. I can rise to ₹1,600 a month; they can rise to ₹2,000. They get quicker promotion also.

Do you think that by throwing open some of the superior appointments in this Department to open competition, you would get a sufficient number of educated young men in this country to make it a real competition?—I have not thought very much about the recruitment of the Department, but I think we ought, if possible, to get the same stamp of men as the Bank of Bengal employs as its agents about the country; and you certainly will not find many of that class among the men who are born and educated in this country. I believe the Bank of Bengal has not engaged any one in this country. I am, however, in favour of competition in India for some appointments.

The Hon'ble Mr. *Quinton.*

Do you think competition would give you efficient men for such appointments?—I think so. The examination would be a general one, something like it is at present; only the standard would have to be raised considerably. I consider the present standard much too low.

The *President*.

Is it necessary that Latin, German, and French should be among the subjects of examination?—No. Latin, German, and French are useful only as tests of a good general education; but the subjects ought to include Book-keeping and Political Economy.

The *President*—contd.

Sittings at Bombay.

WITNESS No. XLIV.—*22nd July 1887.*

Rao Bahadur K. G. Desai.

Examination of RAO BAHADUR KHANDUBHAI GULABBHAI DESAI, Executive Engineer, 3rd grade, Delegate of the Sarvajanik Sabha.

The *President*.

What is your caste?—I am a Gujarati Brahman. I entered the Department in 1870. I was brought up in the College of Science at Poona. In those days anybody was allowed to join the College. I obtained my appointment by competition at the end of my college course. I was head of the list for the year. I matriculated two years before I joined the College. I have had the usual mathematical training up to the matriculation standard, but nothing beyond that. My first appointment in the Department was as Assistant Engineer at Poona, where I was for a year, and was then transferred to Satara in the same capacity. I served as Assistant Engineer for eight or ten years, and was then appointed Executive Engineer, in which capacity I have served in four different districts.

I believe you have embodied certain views with reference to our enquiry in a note?—Yes (*reads*):

MEMORANDUM.

Admission to the Engineering Branch of the Public Works Department, Bombay.

Officers of the Engineering Branch are obtained from (P. W. Code, Chapter I, Section 34)—

(1) Civil Engineers from the Royal Indian Engineering College, Cooper's Hill.

(2) Royal Engineers on the Indian tour of service.

(3) Civil Engineers from the College of Science, Poona.

(4) Deserving members of the Upper Subordinate Establishment.

The first are selected by the Secretary of State for India by a competitive examination after the course of study at the college is finished,

The rest are appointed by the Local Government on probation and confirmed by the Government of India.

All the junior Royal Engineers who apply for admission to the Department are admitted.

As for the Civil Engineers from the College of Science, Poona, two appointments annually have been directed to be made by the Secretary of State, but the Government of Bombay appears to have made a rule that both the appointments are to be conferred only if the candidates pass the final degree examination of the University of Bombay in the first division, failing which, and none passing in the first division, one candidate is appointed to the Apprentice grade.

As regards the conditions of service: all the three classes of officers perform the same duties, but the Royal Engineer officers are liable to revert to military duty in case their services are required in the Military Department. The rate of pay of all the Civil Engineers is the same, but the Royal Engineers on account of their liability to military duty are paid on a higher scale.

The three classes have distinct leave and pension rules, those of the Royal Engineers being the most favourable, and those of the Civil Engineers appointed in India being the least so.

Capacity of Natives of India for rendering efficient service, and their claim to further employment in the Department.

Natives of India were first admitted to the Engineers' Branch in the Bombay Presidency in 1858, when four men were appointed as Assistant Engineers, but from various causes three left the service, and only one, the late Mr. Kahandass Mancharam, adhered to his post, and filled with great credit the office of Presidency Executive Engineer from 1865 to 1875, when he died.

The next appointment was made in 1869 on the passing of the examination of Licentiate of Civil Engineer by the first graduate of the then Civil Engineering College, Poona, which had been established three years previously; and the Government of Bombay was graciously pleased to guarantee one appointment every year to the candidate who should pass with the highest number of marks. This resolution was subsequently modified, and passing in the first division was made a necessary condition; but this modification did not affect the students, as one of them at least passed in the first division, until the University of Bombay raised, in 1877, the number of marks required for the first division from 50 to 60 per cent., and from that time no appointment was made in two years out of seven years; and in 1885, 1886, 1887, instead of two appointments, only one has been made from the same cause.

Considering that opinions differ as to the merits of a design, and on many points of engineering practice, and also considering the large number of subjects the student is required to master, it is very difficult for him to obtain 66⅔ per cent. marks in the severe examination prescribed by the University of Bombay, and a change to the former condition of 50 per cent. might be made, for which purpose it would not be necessary to change the present classing of the University, but the appointments may be conferred on those who pass in the second division for which 50 per cent. of marks is now necessary.

Besides appointing men from the College of Science, the Bombay Government was pleased to make appointments from the upper subordinate branch, and five such appointments have been made

India.

P. W. Department.

Section III.

Rao Bahadur K. G. Desai.

The *President*—contd.

up to date, and the total number of Natives of India who have been appointed in India to the Department is at present 17.

Superintending Engineers and other high officers are alone competent to give an opinion as to the relative merits of the three classes of Engineers, but the fitness of the Native Engineers appointed from the College of Science or selected from the upper subordinate grade may be inferred from the following considerations:—

Mr. Kahandass Mancharam held the post of Executive Engineer, Presidency Division, for 10 years, and Mr. Murzban has been holding the same charge for 11 years, and during that time many large buildings of great architectural beauty have been designed and carried out by him.

Almost all the Assistant Engineers who were employed on famine duty during the famine of 1876-77 are mentioned by name in G. R. 882 P., of 19th July 1878, among the officers who worked to the satisfaction of Government during that trying time; some of them have received the special thanks of Government for the work done by them, and the personal title of Rao Bahadur or Khan Bahadur has been conferred on four of them for meritorious service.

That the Native Assistant Engineers are serving to the satisfaction of their superiors may also be inferred from the fact that most of them have remained attached to one division for a long period —in one case from 1877 to the present time, excepting the two years spent by him in England for practical training.

I advocate the larger employment of Natives of India on the ground of economy also. Although, having regard to the responsible and arduous nature of their duties, entrusted as they are with the disposal of large sums of money and with the duty of constantly combating the forces of nature with the least expenditure of men and material, it will not be practicable to materially reduce their pay, yet they require less leave than Europeans, and their leave rules are and would be less favourable. Their pension rules are also less favourable as they are required to serve longer.

They are likely to live for a shorter time after receiving their pension; this is evidenced by the fact of the Life Assurance Companies requiring a higher premium from Natives than from Europeans. Also they belong to a country with a silver currency, and as their pay is in silver currency, they are less affected by the fluctuations of exchange than the officers from England are. It is well known that the latter are very dissatisfied with the present rate of pay on account of the great fall in exchange, and they would probably have sent strong memorials to Government for increase of pay and pension, but for the reductions and retrenchments announced by Government during the past two years.

Native Engineers would continue to reside in the country after receiving pension, and by serving on Municipal and Local Boards, and giving those Boards the benefit of their experience, as well as by their remaining and spending their money in India, they would tend to make it more prosperous and thus increase its tax-bearing capacity.

The time has arrived when they might advantageously be further employed, and this may be

The *President*—contd.

done by abolishing the Royal Indian Engineering College, Cooper's Hill, and recruiting the Engineering Branch from—

(1) Royal Engineers;
(2) Civil Engineers appointed from the Civil Engineering Colleges.

For the Bombay Presidency the total number of Engineer officers need not be more than 70, including the Superintending Engineers and Chief Engineers. Of this number, 30 may be Royal Engineers and 40 Civil Engineers. In the latter branch, two vacancies per annum may be expected to occur on the average, and if the rule about admission is modified as I have suggested, no further concession is required. If this number be found insufficient, one appointment per annum may be made from members of the upper subordinate branch on the recommendation of the Superintending Engineers.

As the Railway Branch under the Director-General of Railways is for the benefit of all India, one or more men from the College of Science, Poona, should annually be employed in it.

Are you acquainted with all the students who have passed out of the College of Science?—Not all.

Has there been an instance in this Presidency of a European going through the College of Science and obtaining an appointment in the upper grades of the Department?—No.

How do you account for that; how many of them succeeded in coming out first?—The total number appointed since 1863 is twenty-seven, of these two have died, four have retired, and one has been dismissed. I believe there are two Mahomedans among them, one from the College of Science, and the other from Cooper's Hill.

Have you seen anything of the work in the Department of men from Cooper's Hill?—I have had two of them as Assistant Engineers under me.

Have you had any Assistant who was educated in this country?—No. The two gentlemen who have worked under me have done very well. I could not desire any better Assistants.

Do you think they are more efficient than the men who were educated at the College of Science?—I cannot say from personal knowledge, because no Native Assistant Engineer has yet worked under me. I should not think they would be better educated than the men from Cooper's Hill. The subjects taught and the standard of education given at both places are much the same.

Have you been engaged at all in the Accounts Branch of the Public Works Department?—No.

But as Executive Engineer you have to do business with it?—I have to send in my accounts.

When you send in your accounts I believe you have also to send in a note calling attention to any particulars in which your expenditure has exceeded the estimates?—Yes.

Or in which the actual price is higher than the sanctioned price?—Yes. It is a statement called the "objection" statement, and calls attention to any point in which there has been excess.

In your judgment is the technical knowledge of an Engineer required for work in the Accounts Branch, or might the work be done by an Accountant acquainted with the rules of the Department?—I think anybody acquainted with the

The *President*—contd.

rules of the Department might do the work of Examiner or of Examining Accountant.

Your office is inspected by an Account officer?—Yes.

Does it require special technical knowledge to conduct test examinations, or would a good Accountant, with a knowledge of the rules of the Department, be able to do the work?—He would require a certain amount of technical knowledge to know what was proper to be charged to a particular work.

But not necessarily advanced technical knowledge?—No.

Do you think we could educate all the men we want for the Public Works Department in the Engineering College here?—Yes, and for the Accounts Branch also.

Are not the functions of the Public Works Department accounts purely those of audit?—Technical knowledge is an advantage but not a necessity.

The Hon'ble Khan Bahadur *Kazi Shahbudin.*

As a matter of fact Accountants in the Examiner's office are men who have no technical knowledge?—The subordinates have none.

And all the internal work as a rule falls to them?—Yes. They examine the accounts and any irregularities they may notice are brought to the notice of the Examiner, who, if he sees reason, addresses the Executive Engineer concerned about them.

The *President.*

When the accounts come into the office they are first of all checked by the Accountant?—Yes.

How are the examinations of the accounts conducted when your office is examined?—The books I have kept are handed over; some of them are examined by the Examiner himself and others by an Accountant he brings with him, who in fact examines the greater portion of them. When that is done he asks for the accounts of one particular work for a month, and he compares all the vouchers with the account current. That is what is called the test audit.

Who does that part of the work?—Sometimes the Accountant and sometimes the Examiner.

The Hon'ble Khan Bahadur *Kazi Shahbudin.*

Does he ever refer to professional papers such as estimates?—No.

Do you think you could get as much Engineering talent from the Indian colleges as you get from Europe?—The men obtained from the local colleges are quite good enough for the work of the Department.

If you wanted some one to design and construct a bridge over a very rapid and treacherous river, would you be disinclined to employ a man who had been educated at one of these Indian colleges?—If, upon joining the Department, the men from the Indian colleges were employed on railway lines where such works are constantly done, I think that after a certain number of years they would be quite capable of doing works of that kind. At present there is no training field in the Bombay branch of the Department in which they can acquire sufficient practical knowledge of the kind required.

Mr. *Howard.*

Is there no technical school where they could acquire that knowledge?—No. A man must have had practical experience of works of different kinds performed under different conditions before he is capable of designing a very difficult piece of work, like the Nerbudda bridge for instance.

The Hon'ble Khan Bahadur *Kazi Shahbudin.*

Might he not get that experience on one of the local railways?—Yes.

Would that training be sufficient for work in India, and would you get a sufficient number of men so trained from the local colleges?—Yes.

How many Engineers on an average pass out of the Engineering College at Poona?—About ten on an average.

Of these two are annually taken into the Government service?—Yes, if they obtain more than sixty per cent. of the marks.

What becomes of the remainder?—They are given appointments as subordinates or Overseers if they choose to accept them; the rest must shift for themselves.

Is there much scope for Engineers in private practice in this presidency?—Not much. I know one or two men who have succeeded in getting it.

Are those who are taken on to the subordinate branch of the service eligible for promotion to the higher branch?—Not ordinarily.

The *President.*

Have there been many instances of such promotions as rewards for extraordinary merit in this presidency?—Not of men from the College of Science, but from the former subordinates there have been five such promotions.

Do you know of any works of note or merit which have been designed and executed by private practitioners educated in local colleges?—We have one in the large building at Dhurmsala, by Mr. Roganath Pubry, who was educated at the College of Science.

Do you know of any work like a bridge which has been executed by a private practitioner?—No.

Who had charge of the erections in Bombay?—Mr. Murzban, a Parsi Civil Engineer educated in a local college. He executed the work under the supervision of the Superintending Engineer.

He has carried out some of the principal works in Bombay as far as architectural work is concerned?—Yes.

The Hon'ble Khan Bahadur *Kazi Shahbudin.*

Do you know what the passing standards for the B.A. and M.A. are?—It is fifty-three for Honors; for Divisions it is higher.

The *President.*

Is it desirable that promotions should be made from the subordinate to the superior service?—Some men should be given a chance.

Would you make such promotions as a general rule?—I think not.

Sittings at Poona.

WITNESS No. XLV.—*28th July 1887.*

India.

P. W. Department.

Section III.

J. H. E. Hart, Esq.

Examination of J. H. E. HART, ESQ., M.I.C.E., Chief Engineer and Secretary to Government, Public Works Department.

The *President.*

When did you enter the Department?—In 1855. I had previously been in the service of the Bombay and Baroda Railway as an Engineer. I was offered an appointment by the Government as Assistant Engineer in the Public Works Department. I have been employed in Satara, Poona, Nasik, Darwar, Bombay, Sind, and generally throughout the Presidency. I have been employed in the Public Works Department, General and Irrigation Branches, and on special appointments in harbours, &c.

Have you had working under you any young men who had been trained as Engineers in this country?—Yes, several.

Had they qualified as Engineers in the College of Science here?—Most of them had.

How did they do their work?—In a few instances they did their work well; in other instances they were very inferior.

Have you had under you any Engineers who had been trained at Cooper's Hill?—Yes.

Comparing the two classes what would you say of them?—You could scarcely compare them at all; their qualifications and the advantages of their services to Government are so very different. The Native Engineer who has been trained out here is found much more useful in working with the Natives of the country; but in matters of professional intelligence and in decision of character the Cooper's Hill men are superior as a class. There may, of course, be exceptions in this as in every case.

Have you had any men working under you who had been educated at Rurki?—No.

Were the Natives educated in this country who served under you pure Asiatics or domiciled Europeans and Eurasians?—They were all pure Asiatics, —Parsis, Hindus, but not Mahomedans.

Do you know anything of the College of Science here?—Yes.

In your judgment is that institution capable of giving a sufficient training for Civil Engineers in the Public Works?—A theoretical training, yes.

Where do you consider that Engineers educated in the country fail?—It is not so much the education which is at fault; it is the antecedents, and I suppose the hereditary tendencies of the race. Of course there are brilliant exceptions; but as a class they fail.

What are the defects which you have noticed principally?—Want of decision of character under difficulties and of capacity for the practical application of their knowledge. The men who join from the Poona College do so as Assistant Engineers. There are two appointments given each year. Under the orders of the Government of Bombay in 1885, No. 10 of the 18th February 1885, the candidate who passes in the first class of the degree of L.C.E. is to be appointed an Assistant in the third grade, and the candidate next in order of merit may be entertained as an apprentice on probation for one year.

The *President*—contd.

With regard to irrigation, do you find that the same difference obtains between Engineers trained in England and Engineers trained in India?—I spoke chiefly with regard to constructive engineering. Irrigation has a great deal of administrative work in it.

Which are the best for administrative work?—There is not so much difference there, because as long as a man is of good moral character and above bribery or anything of that kind, it is merely a matter of carrying out rules.

Have you not construction work in irrigation also?—Yes, and as regards construction the general rule holds good; in administrative work, if a Native is honest he is just as good or even better than a European. He is better because he is more in touch with the people, who are often afraid to come to Europeans. If a Native and a European have an equally high moral tone, the Native will be the better in administrative work.

You say that to their general incapacity for constructive work you have found some brilliant exceptions amongst the Natives. Of what class were they?—One was a Parsi, the other was a Mahratta Brahman; but, of those I have had any personal experience of, the Parsi has been the higher class of man altogether.

The better educated?—Of course he has been well educated, and as a matter of comparison perhaps the better educated. Both the gentlemen I have mentioned were employed on large public buildings in Bombay of which I was in charge for nearly two years.

Was their general education deficient as compared with that of Cooper's Hill men?—Certainly in many respects. A Cooper's Hill man as a rule has got rather a classical education. In my opinion it is a different kind of education which is given out here.

Do you know whether the more educated classes of Natives attend the College of Science here? Do the men who are most thoroughly educated take up the Engineering course?—I think the best educated men take to the Educational Department.

How do you find the Native Engineers in respect of physical endurance?—They certainly have not the physical endurance of the European except with regard to the sun, and even with regard to the sun it is a doubtful question as long as the European is in good health.

Are the men in the upper subordinate grade good men as a class?—There are very good men among them.

Have you met any men in that grade whom you think might be promoted to the superior grade?—Yes. I think every L.C.E. should enter the Public Works Department in the upper subordinate grade, and having shown themselves practical Engineers, not merely book-men, should be selected for promotion; that is, those who have taken the highest number of marks. I have on two or three occasions recommended, and I am

The *President*—contd.

happy to say been able to secure, the promotion of men from the upper subordinate grade to the Engineering Branch.

Are those men now in the Department?—One is.

Were they Natives of India?—Yes. One is a Parsi and the other a Hindu.

Have they justified your recommendation?—I think so. I have never heard that they failed.

Have you anything to say about the constitution of the Department?—Only that I think the Public Works Department should be recruited chiefly by selection and not so much by the passing of examinations either at Cooper's Hill or at Chatham, or Dublin, or Oxford, or any other place. The officers of this Department should be selected from the profession generally.

You have probably met some of the Engineers who were called Stanley Engineers?—I have met a great number of them.

How did they compare with the Cooper's Hill men?—I think on the whole I should say they were successful. There were some accidental circumstances connected with those appointments which brought in some men who were not exactly entitled to call themselves Civil Engineers by their training, education, or practical knowledge, but whom Government found they could not put into the lower grades and had no choice but to put them into the higher grades. I think a few of these men were utter failures; on the other hand some of our very best men have been Stanley Engineers.

Superior to the best Cooper's Hill men?—Yes, the Cooper's Hill men have no practical experience until they have got it at the expense of Government. The college training of a Cooper's Hill man is not of much advantage in practical work, and until he has had actually to apply his theoretical knowledge and been forced to apply it either by the desire to succeed in his profession or the necessity for earning his livelihood, he does not make a thoroughly competent Engineer.

The Hon'ble Khan Bahadur *Kazi Shahbudin*.

What is the average general education of the students who join the College of Science here?—They join the College before they go up for a degree. I believe they enter and then matriculate, and if they intend to go on for the L.C.E. they put in their terms at the College for the necessary education in Civil Engineering.

Do you think the education of a matriculated Native student is a sufficient general groundwork for the profession of Civil Engineering?—Certainly it is. The education they receive in the College of Science is, so far as I know, quite sufficient.

Have you heard it said that many matriculated Natives, even those who have taken the B.A. degree, cannot write a good English letter?—I have heard of such cases, but I think it is not so much good English as good sense which is necessary in the profession. You must remember that English is an alien language, and you cannot expect a very high standard of English knowledge from the Native unless he chooses to keep it up. I have known Englishmen out here—clever men—who even after many years in India could scarcely speak a word of the language. They had not the aptitude for it.

The Hon'ble Khan Bahadur *Kazi Shahbudin*—contd.

Why do Natives as a rule prefer the Educational Department to this? Is it not because their prospects as students at the College of Science are so very limited and uncertain?—There is certainly a very small opening out of the College of Science.

Do you think that it affords a sufficient inducement to those who have distinguished themselves in the University course?—It may be a very small inducement in proportion to the number of men who go in for education. I suppose in each class there are from twenty to thirty students.

If more appointments were thrown open to the students of the College of Science, do you not think we should get more graduates to enter the College of Science for the purpose of qualifying themselves for the Public Works?—Certainly.

And do you not think that in that case you would get better men for the Department?—Very naturally, because the larger the range of selection you have, the greater the number of individuals who will be successful; but it does not follow that the percentage will be better. They will be slightly superior from the educational point of view, but they need not be of the slightest use as Engineers. A very highly educated man is perhaps unsuited to the practical details of our service. You must remember that a man who enters the Public Works goes through a long period of very troublesome hard work, whereas a man who becomes a lawyer or enters the Educational Department has not to undergo anything like the same physical labour.

In case a physical as well as an educational test was laid down, would not the Department gain by throwing open a larger share of the appointments to the best-educated Natives, remembering that physical exercises are resorted to by Natives very largely nowadays?—A certain number would show themselves fit and capable; but it is a very difficult question, because the physical test has scarcely been developed in England yet.

As regards professional training, could not men be educated in India up to the standard of Cooper's Hill?—It would not be easy, I think. You have not got the professors nor the range of teaching that you have there, nor the works that are always going on in England, the examination and carrying out of which is placed within the range of Cooper's Hill men in order to give them experience.

If all the Engineering institutions in India were welded into one, would there be any difficulty in getting teachers from England?—I say you should first educate your man and then allow him to find his level professionally; those men who have succeeded more or less professionally are the men, in my opinion, from whom you should select your Europeans for service in India.

Suppose the present system of competitive examination retained, and all the Engineering teaching in India concentrated in one place, would there be any difficulty in obtaining the most competent professors?—I think you would always have a difficulty in inducing first-class men to come out to this country, unless to a regular service, and even then

India.
P. W. Department.
Section III.
J. H. E. Hart, Esq.

The Hon'ble Khan Bahadur *Kazi Shahbudin*—contd.

they would be working in the same groove year after year; whereas at home you get a fresh set of men constantly flowing in with fresh ideas. Such an institution would bear the same relation to some of our training colleges at home as the Bombay University does to Oxford and Cambridge. You would have to get practical men from England to teach Engineering. There is no question that you could get the scientific men; the difficulty would be to get the practical men. In Cooper's Hill they employ distinguished men with practical experience to teach; that would be a difficult thing to manage out here.

When you say we have not the works in India, what kind of works do you mean?—Not only civil but mechanical engineering works. Civil engineering has introduced an immense amount of mechanical engineering, and a man cannot be a good Civil Engineer unless he knows a very large amount of mechanical engineering. He may not be able to work with his own hands as a Mechanical Engineer is supposed to do, yet he must know how to apply the art of mechanical engineering and where it can be applied economically and with advantage.

The Hon'ble Khan Bahadur *Kazi Shahbudin*—contd.

Do the Cooper's Hill men who enter the Department go through any course of mechanical engineering?—Not much. I believe at Cooper's Hill there is a mechanical workshop, but that is mere play of course. Most of them who have a mechanical turn go to some of the large mechanical centres, such as Sir Joseph Whitworth's manufactory; but it depends on the man's aptitude and application whether he makes any use of what he sees there, or whether he merely does just sufficient to pass the Government Inspector whom the India Office sends round. Whether he will be of any real use we can only find out when he comes to this country.

The *President*.

Have you anything else to say?—No.

WITNESS No. XLVI.—*28th July 1887.*

Dr. Theodore Cooke.

Examination of DR. THEODORE COOKE, M.A., LL.D., F.G.S., M.I.C.E.,—Principal of the College of Science, Poona.

The *President*.

How did you enter the Department?—I came to India in 1860 as an Engineer in the Baroda Railway. I obtained my present appointment in 1865.

Do you prepare men for the degree of L.C.E. in your College?—Yes.

And also educate men for the profession of Mechanical Engineering?—Yes.

And for any other branches of the public service?—Yes, Forests. We have an Agricultural class, and we teach also for the degree of Bachelor of Science in the Bombay University.

Are you acquainted with the course of instruction given at Cooper's Hill?—Yes; from the Calendar.

Can you tell us whether the course of instruction given at your College is practically identical with that given at Cooper's Hill?—It is almost.

Are you able to secure in this country as efficient a teaching staff as they have at Cooper's Hill?—As far as it goes the staff is fairly good, though it is very small for the work it has to do. We have a Professor of Chemistry who is a graduate of the University of Dublin in honours, and who has also taken his Engineering degree at the Dublin University and is a graduate of Arts of the same University.

Had this gentleman any practical experience of Engineering?—No.

What subjects does he teach?—Chemistry and Geology. The next is a Professor who served his apprenticeship to a Mechanical Engineer somewhere in Scotland and was employed in engineering work in this country for a considerable time on the Bombay, Baroda and Central India Railway, and was subsequently Principal of the School of Art at Jaipur. He teaches Civil Engineering, Mechanical Engineering, and Mechanism. The next on the staff is the Agricultural Teacher who is also Teacher of Botany. He came from Kew, being brought out by Dr. Dalziel as Superintendent of the Botanic Gardens. For Forestry, we have the whole staff to teach incidental subjects, but one of the Forest officers lectures during the rains specially on Forestry, and for practical instruction in Forestry the students go out for two months every year into the districts with Forest officers. I have got four teachers, the Head-master and three assistants: they teach all the minor branches of Engineering. They were educated at the College: one, the Head-master, is a European, and three of them are Parsis. The Second Master is a B.S.C.E. in Engineering in Edinburgh, and also a fellow of the Royal Society of Edinburgh. The other two teachers passed through the College; one of them was employed in the Baroda State service for a long time, and the third was employed on the Goa Railway. He passed the L.C.E. before he entered the College. They teach Surveying in particular.

The *President*—contd.

Has the European had any practical experience?—He was on the Baroda Railway, but more as a kind of amateur. He draws very well. He was a former pupil at the College, but did not take a degree.

Mr. *Howard*.

He is self-educated?—Yes.

The *President*.

What subjects do you yourself teach?—Almost every one and some Engineering subject always. I teach Experimental Physics. I was a gold medallist in Experimental Physics. If the Chemistry Professor goes on leave I have to teach Chemistry also.

The *President*—contd.

What practical training do men get at your College?—About the same as they get anywhere else,—that is to say very little, except in Surveying, in which they get practical training all through the cold weather; but practical training is impossible without work. They have tried to introduce practical training in all similar institutions on the Continent, but always failed. I am talking about practical instruction in Civil Engineering.

Mr. *Howard.*

For instance they are wanting in knowledge of building and of details?—Of course they must be so.

The *President.*

You yourself have been employed as a Civil Engineer in this country for several years?—Yes.

What was your experience of Native Civil Engineers?—I never had to do with any, but I saw something of Native subordinates.

What is your opinion as to the chances of success in life, as Civil Engineers, of the young men turned out of your College?—It depends on two things: (1) on the man himself, whether he has got any gift for Engineering; it does not follow that because a man comes to a Civil Engineering College in this country that he has a gift for Engineering; more probably it is because he has an idea that that line will pay him better than any other. And (2) it depends on where his lines are cast, or the opportunities he has for acquiring a practical knowledge of his profession.

Is it necessary that we should continue to import Civil Engineers from England?—My last answer almost shows that it is. The teaching which should fit a man for the higher branches of the profession is in a great measure wanting in this country; you cannot keep up to the time of day. It is so with all European technical sciences.

Two appointments annually are given to your College?—Yes, one absolutely and the other contingently on the man getting a first class in the examination. The one who gets the absolute appointment is taken on as an apprentice.

Is that number of appointments sufficient to give a healthy stimulus?—It creates a healthy stimulus, but I should like to see something more.

Do you think we could with safety reduce the number of appointments at present recruited from Cooper's Hill?—They might be reduced a little. I have always felt rather strongly that Cooper's Hill was hardly wanted. Seeing that we have the whole of the profession to go to at home, why keep up a special college from which we must take a certain number of men whether we want them or not?

You would prefer to select the men we want from persons of practical experience?—Yes, and also from persons who have had a good theoretical training. Several of the Universities at home have very excellent Engineering schools attached to them; Edinburgh, Dublin, and London, for instance.

Do you think we should get a cheaper service by taking men before they have made their mark as Engineers?—Of course.

Mr. *Howard.*

Would you have these men enter in the higher grades?—No, because I do not think it would be fair to men already in the Department; but that is a departmental question.

The *President.*

Would it be possible to create a special department for important works and have at the same time a general department for less important works?—I do not say it would be impossible, but a question of that kind would be better answered by some expert in the Department.

Could we not have a Public Works Department which would find employment for a larger number of men sufficiently educated in India and which would require only a small recruitment from England?—I think it quite possible.

Have you a Mechanical Engineering branch in your College?—Yes, a very good one. It is supervised by a Mechanical Engineer.

Do you think your College could supply a sufficient number of men to take the superintendence of mechanical engineering work?—No. Our Mechanical Engineering branch is a special institution. The boys who enter it do not go into the main College. I have a large shop of machinery of sorts, and I do work for the outside public as far as it goes. The boys are apprenticed to me for three years, and at the end of that time I select some of them for the College. I have probably about ninety odd boys in the College, and almost all the work of the workshops is done by them.

Mr. *Fernandez.*

Would they be fit for marine engineering or to take charge of a mill?—To be able to take charge of a mill a man must go to a mill and learn. One of them passed the L.C.E. last year, and is now junior Engineer on board a steamer belonging to the Sultan of Zanzibar. He is a Parsi. Lots of them have gone from the workshop to become Engineers on steamers.

Do you educate men sufficiently to be qualified to conduct trigonometrical survey work?—Quite. We make the trigonometrical survey of the whole of Poona every year as far round as we can extend. Of course every one must have a little practice.

The *President.*

Do you give them an education which, with the practice which every man must have when first he enters on a special branch of work, is sufficient to fit them for the work of the Department?—Quite so.

Do you teach them Astronomy?—It is one of the optional subjects.

Do you require pupils for the trigonometrical survey to be able to take sights and work up their longitude and latitude?—They do not as a matter of fact, but it would not take very long to teach them.

Do they learn logarithms?—Oh, yes; all the higher mathematics.

Have you any young men at your College who would be able to take charge of a staff of workmen?—Yes; but, like everything else, these boys require a little practice.

India.

P. W. Department.

Section III.

Dr. Theodore Cooke.

The *President*—contd.

Do you see anything in the moral character of the men which would be against their doing so?—They have always this disadvantage compared to men from England, that their education is, as a rule, cramped and confined. A man comes to me whose ideas have probably never gone out of his native village.

Is there anything in the men that unfits them for the charge of working parties?—No. When I was on the railway I had some who were excellent men for that purpose. They have got one advantage which ought to tell in their favour,—that is, they know the language and understand the customs of their workmen, which men from England do not. Lots of men from our place have been in charge of detachments of survey parties on the railways. When the last Baroda Railway survey was made, work of this kind was almost entirely done by men from the College. I have one man in the College now who was in charge of a very important party on the Baroda Railway extension survey and has very high certificates of having made an excellent Survey officer.

The Hon'ble Khan Bahadur *Kazi Shahbudin.*

You said there were no means by which pupils in your College could obtain a practical knowledge of Engineering?—That is the same in every college.

But there are means in the country?—Yes, to a certain extent. A man's career in life, it must be borne in mind, greatly depends on the opportunities he has after leaving college. If he is put under a man who has an important work going on it is a great advantage to him. He may, on the other hand, be put to look after the repair of a road.

What general education do students receive before entering the College?—Up to the matriculation standard.

Do any degree-holders enter the College?—Often. I have, I suppose, half a dozen at present.

Do they compare favourably with the men who have merely matriculated?—Yes, because their English is better and they are better able to follow the lectures.

What education have boys who enter the Mechanical Engineering College received as a rule?—We require them to have passed the fifth educational standard. They can speak English tolerably well, and are just able to read, write, and cypher.

Is there any scope for private practice in Mechanical Engineering in this presidency?—There is in Bombay, but nowhere else.

Do any pupils from your school join the Revenue Survey Department?—No.

Do you know the kind of surveying which is carried on in the Revenue Department?—It is plain land survey.

Do you know anything of the work of classification of soil?—No. I have just been offered the services of a Classifier by the Director-General of Agriculture. He is a Native.

The work, I believe, is very simple?—It must be, judging it by the men who take it up and the pay they get. I know nothing about it, though.

The Hon'ble Khan Bahadur *Kazi Shahbudin*—contd.

And yet I am told that they never promote Natives to supervising and controlling posts in this branch of the Survey, because they say Natives are not fit. Do you think you could easily turn out a good Classifier from your College?—The Director of Agriculture, who is very anxious that a man who enters the Agricultural Department should have a knowledge of classification, has offered to get me a Classifier on ₹50 a month.

Do you think that if this Department were thrown open to educated Natives either from your College or elsewhere, it would get much better educated men?—I should think so.

Mr. *Nulkar.*

During your visit to England had you an opportunity of visiting Cooper's Hill?—Never. It is about six years since I was in England.

Have you any idea of the general appliances for imparting information and training Civil Engineers at Cooper's Hill?—None except what I see in the calendar with regard to the names of Professors there.

Do the Cooper's Hill men derive any better advantages while in England from observation of the large works which are going on all over that country than your men have here?—They get far more opportunities in England, but I am unable to say whether they take advantage of them. We have got more means of giving practical training in our College than almost any College in India possesses.

Are there any means by which the present state of things may be improved?—I think not. The weight of evidence is against any attempt to make a theoretical instruction a practical one. It has been often tried and always been a failure.

This applies to all similar institutions all over the world?—Yes.

Are the men you turn out from your College and the men from Cooper's Hill on a par as regards qualifications?—I scarcely know a Cooper's Hill man. They have never come under my observation.

Is there any room for improving your College so as to give more efficient instruction to pupils?—Yes. We want two or three more Professors. If we had them placed at our disposal we should be much more efficient.

Would it improve the quality of the men you turn out?—Ever so much, I think.

I suppose you watch the careers of your pupils after they leave your College?—As far as I can. Of course I am in Poona and they are in the districts; but they always come to see me when they are in Poona, and I often meet them when I go out.

What is your opinion of them generally?—Some of them have done extremely well as far as I know. Many of them have done very well on the railways. The year before last I came from Goa up to Dharwar and met a number of my late pupils on the Goa line who were drawing salaries up to ₹600. I believe also several of my pupils are holding very good appointments on the Southern Mahratta Railway.

WITNESS No. XLVII.—*28th July 1887.*

Examination of COLONEL A. T. MANDER, R.E., Acting Superintending Engineer, Central Division, and Temporary Superintending Engineer, 2nd class.

The *President.*

When did you enter the service?—I arrived in India in 1857. I joined the Department in 1858. I have served in the whole of Bombay with the exception of Sind. I have had nothing to do with irrigation; my service has been entirely in the General Branch of the Public Works Department.

Will you kindly tell us what you think of the present mode of recruiting the supervising branch of the service?—I should be inclined to recommend the starting of a Military Works Branch here, such as they have on the other side of India, and confine the employment of military men, officers and subordinates, to that.

You would divide the Public Works into two branches?—Yes, Military and Civil. I do not think it would be right to send a young Royal Engineer officer to work under a Native Executive Engineer.

Is the system of recruiting from Cooper's Hill and the Indian colleges a good one?—Yes.

Is it necessary to recruit so large a number from Cooper's Hill as fifteen a year; would you decrease the number of appointments made in England and increase the number of those made in India?—It all depends on the class of men you could get in India. I should be inclined to leave things alone.

You do not think that, with due regard to efficiency, we could reduce the number of appointments made from England and increase those made in this country?—No.

Whom do you consider the better Engineers—those educated in England or those educated in India?—Those educated in England.

Why do you think so?—I think they have had a better technical education, and I think they know a little more about practical engineering. Before they come out they are taken round the large works in progress and taught by experienced men at home. They have greater opportunities and have an opportunity of listening to lectures given by the leading professional men at home which they would miss out here.

Is it your experience that men generally learn the practical working of their profession when they have left the institutions in which they obtained their theoretical knowledge?—Yes.

Therefore it sometimes happens, does it not, that men who have received an inferior theoretical training overtake those who have had a superior theoretical training?—Yes, owing to their natural aptitude for the work.

Have you met Natives of India whom you considered thoroughly competent Civil Engineers?—Not very many, but there are such men certainly.

Do you know anything of the course of education which is given at the College of Science here?—Not much.

You have had men from that institution serving under you?—Yes.

Did they appear to have received a sufficient professional education here?—Yes, as a rule. I have had men from this College who had not received an ordinary education in English, who could not write an English letter.

The *President*—contd.

But whose professional knowledge of Engineering you thought sufficient?—Yes, as far as you can get it in theory it was fair.

How do these men turn out as a class?—They evince a great want of energy very often. A young man becomes Assistant Engineer and straightway considers his career is made, and that he has very little to do but just to draw his pay. I should say there is a great want of energy shown among Native Assistant Engineers. Of course there are exceptions and brilliant ones.

In emergencies, and calls for action which are not covered by any incidental orders, how do you find Natives?—Much inferior to Europeans.

Why is that; is it from a too great sense of responsibility or a too little fertility of resource?—Want of courage.

Do these men show constructive ability; are they good at designing and executing?—Up to a certain point they are very good, but beyond that point they have very little experience, not having seen any big works in India. I should recommend that all Native Assistant Engineers, after having been in the Department say for a year or so, should be sent for two years to some Engineer at home for a course of practical training. Some of them have had that training, and others are having it now. I may mention one—Mr. Ibrahim Shah Dowd Ahamad, who is in England now.

Is he there at the Government expense?—Yes.

Comparing Civil Engineers educated in this country with those who have been educated at Cooper's Hill, which do you consider superior as a class?—The Cooper's Hill men: their average of excellence is higher.

Have you found Engineers educated in this country who could hold their own with the best of the Cooper's Hill men?—No, I do not think so.

Do you consider that the rules of the service should allow of selections from the upper subordinate to the Assistant grade?—In cases of great and recognised merit I do.

Have you met many good men among the upper subordinates?—Yes.

Have you recommended them for promotion?—Yes, in one case: the man had been through the Poona College. A great number of the upper subordinates, the Overseers, have taken the L.C.E., and I believe they are promised that if they prove good men they will be entertained as Assistant Engineers; and that is not at all a bad way of promotion. It is not always the man who is first in the examination who is the best.

Have you seen much of the work of Natives in surveying?—Yes.

Do you consider they are competent to carry on surveys; could they work a topographical survey?—I should think they could.

You have seen them in survey work?—Yes.

Have you found them capable of taking charge

India.
P. W. Department.
Section III.
Col. Mander, R.E.

The *President*—contd.

of working parties?—They are not so much so as Europeans, but there are exceptions.

What is the largest number of men you have known a Native to take charge of?—Two or three thousand engaged in road work. He would be in charge of a section of a road in progress.

In the Survey Department it is thought that Natives cannot take charge of parties?—That is a mistake.

Would you have any difficulty in finding competent Native Sub-Surveyors to take charge of a survey party of two or three hundred men?—They would have to be selected men.

Mr. *Nulkar.*

You say that a Native Sub-Assistant Engineer thinks he has attained the summit of his ambition when he has got an Assistantship?—I say that is the general tendency.

Because we find that six of them have risen to be Executive Engineers?—I can recollect at the present moment two that I should certainly put down as indifferent, as not caring to improve themselves.

How many Executive and Assistant Engineers of this class have you known in the course of your service?—No Executive Engineer, I think, or he would never have attained that grade. I suppose I have known fifteen or twenty.

And two of them were indifferent as to their work and the approbation of their superiors?—Yes.

Do you share Mr. Hart's opinion that selection among practising Engineers of proved merit should be preferred to Cooper's Hill as source of recruitment?—It would be very difficult to manage. The class of men you would get would depend on the value of the prize. You would not

Mr. *Nulkar*—contd.

get the best men at home to come out here to a hot climate and a small salary. I do not think that in a big Department like this it is absolutely necessary that you should get men who have already had practical knowledge. I should be inclined to favour Cooper's Hill myself.

Would it be impossible to educate men to the Cooper's Hill standard here?—It would be very difficult. We have not any Civil Engineers and distinguished men here who have time to lecture unless you paid them highly, and a good deal of the knowledge of Cooper's Hill men is got by lectures.

Suppose the system of selection advocated by Mr. Hart were introduced, what would be the result?—You would get a very fair class of men.

The Hon'ble Khan Bahadur *Kazi Shahbudin.*

Are you acquainted with the course of instruction given at the College of Science here?—No, but I know that it is more theoretical than practical.

From your knowledge of the men who have passed from the College to this Department, do you consider that the course of instruction—even theoretical instruction—given there is inferior to that given at Cooper's Hill?—Yes. They teach to a very high standard at Cooper's Hill.

Do you know the standard at Cooper's Hill?—Yes; I have seen the plans and books of a young Assistant. The young men I have had in the Department from the College of Science were certainly not educated up to that point.

What practical education do the Cooper's Hill men receive before they come to India?—They have practical lectures given them by men in actual working at home, and they are taken out for a year on to works.

WITNESS No. XLVIII.—*28th July 1887.*

Khan Bahadur M. K. Murzbán.

Examination of KHAN BAHADUR MANCHERJI KAVASJI MURZBÁN, Ass. M.I.C.E., Executive Engineer, 3rd grade, Presidency Division.

The *President.*

When did you enter the Department?—In 1857. I had been educated at the Poona Engineering School, the present College of Science. I entered the upper usbordinate branch, Public Works Department, and was employed on Survey duty in connection with the Poona Water-works. I was afterwards employed in the office of the Executive Engineer, Poona and Kirki, and had charge of a large subdivision. In 1872 I was promoted to be an Assistant Engineer of the 2nd grade, and was appointed Acting Executive Engineer at Bombay, and was subsequently confirmed in that appointment (*reads*):—

The establishment of the Public Works Department is divided into two distinct branches, *viz.*—

The Executive
and
The Accounts.

The Executive Branch is classified as follows:—

(1) Engineer Establishment,
(2) The Upper Subordinate,
(3) The Lower Subordinate.

The *President*—contd.

Since the year 1880—

22 Civil Engineers appointed in England,
26 Military Engineers, and
7 Passed students of the College of Science have been admitted into the Engineer Establishment, and
1 Upper Subordinate officer has been promoted to the same establishment.

I am of opinion that Natives of this country are quite capable of conducting the duties ordinarily required of Engineers in the Public Works Department, but I think that, for some time to come, a fair proportion of Military Engineers and European Civil Engineers should be maintained in the Department. The former by virtue of their superior education and their military position give prestige to the Department, and the latter by frequent visits to England bring fresh knowledge and information from that country, and create a healthy emulation in the Department.

The qualifications of Military Engineers for such duties as the Public Works Department

The *President*—contd.

performs are frequently ridiculed, and humourous anecdotes have been invented of barracks built without entrances and upper-roomed structures without staircases. But I desire to express the opinion that the country owes much of its prosperous condition, its roads, its canals, its bridges, and some of its architectural adornments, to the talent and industry of Military Engineers. We in Bombay especially should have no hesitation in offering the testimony.

It seems to me that the appointment of European Engineers in the Indian Public Works Department should not be restricted to the passed students of the Cooper's Hill College, but for special works men should be obtained from England, either by means of public competitive examinations or by selecting men of acknowledged ability in the profession generally. In my opinion, the "Stanley Engineers," who were obtained by the former method, have proved as good as the Cooper's Hill men. I may state, however, that the salaries of the different grades of Engineers in the Public Works Department are not sufficient to induce really capable men to come out to this country.

All young Assistant Engineers should be first placed in Executive Engineers' offices, where large engineering works are in progress, so that they may have opportunities of seeing the various modes of construction in vogue in India, and gain a knowledge of the resources of the country and of the different kinds of building materials obtainable. At present these young men are generally placed in charge of small subdivisions, where only small works and ordinary road repairs are in progress. The result is that they do not get opportunities to show what they can do, and their capabilities for doing work are not known.

The present system of recruiting the Engineer Branch with Native Civil Engineers from L.C.Es. of the College of Science appears to me to be unsatisfactory.

Two appointments are at present annually guaranteed to those who pass the L.C.E. examination with the highest number of marks. To gain this end the young men devote themselves principally to the study of the physical sciences and such other departments of book-knowledge which are productive of a large number of marks in the examinations. Not much attention is paid to Engineering, and the men devote little or no time to the practical part of their future profession.

This system of selection gives us the best men in Mathematics and Natural Sciences, but not always the best for the Engineering profession. I am of opinion that the most satisfactory method of obtaining the best men would be to select eight or ten men every year from among the most successful L.C.Es., and to employ them in the upper subordinate establishment. These men should be kept in that establishment for a certain time, and the best three or four of that number should be admitted into the Engineering establishment.

The passed Native students, if admitted at once into the Engineering establishment, should be kept in the class of "Apprentices" for a period

The *President*—contd.

of two years, during which time they should be employed under Engineers whose works are of the largest description. After the above period they should be promoted to the 3rd grade of Assistant Engineers.

The former system of advancing deserving upper subordinates to the Engineer grades has of late years been given up. Several L.C.Es. have proved good Assistant and Executive Engineers, but I am of opinion that men advanced from the upper subordinate establishment have turned out much better. I am therefore strongly in favour of really good and deserving men being promoted from the subordinate to the Engineer establishment.

The whole of the upper subordinate establishment should, I think, be recruited from the Natives of the country, but it is necessary that a few military subordinates should always be employed to look after military works, &c.

The training now given at the College of Science should, I think, be so directed that those who enter the subordinate grades may be competent to undertake the duties usually performed by Clerks of Works in England.

I desire to invite the attention of the Sub-Committee to a matter which, I am informed, affects the position and promotion of Native subordinates. I bring this to their notice in order that they may suggest a remedy if, after instituting the necessary enquiries, they find the grievance to be well founded.

The present sanctioned strength of the upper subordinates is 220. It consists of Europeans, Eurasians, and Natives of all classes. The Europeans and Eurasians are arranged in one class, and the Natives in another.

It appears from the last Classified List of Members of the Public Works Establishment that the present strength is as follows:—

Europeans, including Eurasians .	56
Natives	157
TOTAL . .	213

The proportion of the two classes is therefore nearly as 1 to 3.

They are distributed as follows:—

	Existing number.		Total.
	Europeans and Eurasians.	Natives.	
Sub-Engineer, 1st grade . .	5	3	8
Ditto, 2nd do. . .	5	2	7
Ditto, 3rd do. . .	8	12	20
Supervisor, 1st grade . .	12	13	25
Ditto, 2nd do. . .	13	31	44
Overseers, 1st grade . .	7	27	34
Ditto, 2nd do. . .	2	36	38
Ditto, 3rd do. . .	1	33	34
Extra Assistant Engineers (Military)	8	...	8
TOTAL .	56	157	213

It appears to me that, to accord with the

India.

P. W. Department.

Section III.

Khan Bahadur M. K. Murzbán.

The *President*—contd.

proportion of Europeans and Natives in the Department, the distribution should be as follows :—

		Proposed.	
		Europeans.	Natives.
Sub-Engineer, 1st grade . .	10	3	7
Ditto, 2nd do. . .	10	3	7
Ditto, 3rd do. . .	20	5	15
Supervisor, 1st grade . .	25	7	18
Ditto, 2nd do. . .	42	11	31
Overseers, 1st grade . .	106	27	79
Ditto, 2nd do. . .			
Ditto, 3rd do. . .			
Total .	213	56	157

The result of the present system of distribution is, as will be seen from the last published list of subordinates, that Native subordinates of 29 and 30 years' standing are still in the 3rd grade of Sub-Engineers, while European subordinates of 23 and 24 years' service in the Department are in the 2nd and 1st grades of Sub-Engineer.

I am of opinion that the present system of making the appointments and of fixing the number of Europeans and Natives in the different grades requires revision, so that both classes may be promoted to the higher grades at equal periods of service.

Europeans are appointed to the 1st grade of Overseers, and Natives to the 3rd grade. On first appointment the salary of the 1st grade is ₹100, and of the 3rd grade ₹60. I have made no distinction in my note between Europeans domiciled and non-domiciled. It did not occur to me to do so. There is no rule that Europeans should be appointed to the 1st grade and Natives to the 3rd grade, but it is the practice. I cannot say whether the rule is the same with regard to civilians and military alike. Out of 42 Overseers, 1st grade, there are 6 Sergeants or Corporals. Except Mr. C. Simon, there are no other Europeans or Eurasians. Mr. C. Simon entered in the lower subordinate establishment. About 1869 the College of Engineering was instituted. There was previously no Engineering School. There were about 40 or 50 pupils attending it when I was a student there. There were 2 classes, and I think about 20 boys in each. I passed out in 1857. I have become Executive Engineer in 30 years. I only remember one European who rose from the subordinate establishment to the Executive Engineer grade, but several Natives were so promoted. I was promoted for special merit. I presume the others were also. The Natives have no ground for complaining that they have not been promoted for special merit. I do not complain that Europeans are promoted over the heads of Natives, but I complain that there are two lists, one for Natives and one for Europeans, and that the promotion is given to a Native or a European according as there are vacancies in each list. There are many more Europeans than Natives in the two highest grades of the upper subordinate service.

I have not personally had much experience either of the Stanley or Cooper's Hill Engineers. I have seen the work of about 3 or 4 Stanley Engineers, and of 1 or 2 from Cooper's Hill. The

The *President*—contd.

Cooper's Hill men were of 3 or 4 years' standing, and the Stanley Engineers were of 8 or 10 years' standing. If the recruitment of men from England is not to be restricted to Cooper's Hill, the salaries paid to induce men to come to this country must be increased. I am aware that the Cooper's Hill men at present undergo a course of practical training for one year. There are 4 or 5 Executive Engineers' offices in this Presidency where large public works are going on. In my office there are at present the following works: the Government Press and General Record Office, the Police Magistrates' Court, the Wilson College, a large extension of the Telegraph Office.

The Nira Canal is being executed in the Poona District. The Engineer for the defences of Bombay, a Royal Engineer, has batteries to construct. The Executive Engineer at Ahmedabad is constructing a military fort. I would employ young men after they enter the Department for two years in offices where the larger works are carried on. The upper subordinates could afford the Executive Engineers of the district sufficient assistance. About the time I entered the Public Works Department all the Native Overseers were acquainted with English. I know that some of the Natives were not skilled in geometrical drawing; we were not taught free-hand drawing.

Have you anything further to say?—I would suggest that Europeans appointed to the first grade ought not to be appointed to the higher grade until those Natives who were appointed after them in the lower grade have succeeded them in their respective places in the higher grade. I would separate military and civil subordinates entirely.

Are they not practically separate now?—I was not aware of that. I would also suggest that an equal number of appointments should be reserved in each grade for Natives and Europeans. What I say is that deserving upper subordinates, European or Native, military or civil, should be promoted. I have nothing further to say.

Are you aware that under Rule 47 promotions are to be made by selecting the individual who by his good conduct, superior management, and the possession of a higher degree of professional knowledge as evinced by his passing the test known as the higher, or college, standard at Rurki, shall appear most worthy of advancement?—That rule is not acted on.

Overseers have very responsible duties?—Yes.

And the duties of Sub-Assistant Engineers are even more important?—Yes.

Then you would require to have picked men for the work?—Yes.

Have you anything to say as regards the pension rules of your Department?—No.

Do you think that Public Works officers recruited in India, in order to give them an opportunity for improving their acquaintance with works in England, should be allowed furlough to England in the same way as the Public Works officers recruited in England are?—It would be an advantage, but I do not suppose many would avail themselves of it.

Are you entitled to a superior pension if you become a Superintending Engineer?—I do not think so.

The *President*—contd.

You are aware that certain officers have that privilege?—Yes.

What is the highest pension you can get?—₹5,000 a year.

Mr. *Nulkar.*

How long have you been employed as an Executive Engineer, and in how many places?—I think I have been Executive Engineer for the last nine or ten years, and always in Bombay.

Where were you employed before?—In Survey duty at Poona City Water-works, and afterwards in the office of the Executive Engineer at Poona and Kirki.

You have had an opportunity of watching the work of Stanley and Cooper's Hill Engineers?—Yes.

And also of Native Executive Engineers?—Yes.

Will you tell us candidly whether you saw any difference in the efficiency of the work performed by these men?—I have not seen much difference one way or the other.

Your work in Bombay is of two kinds: (1) by contract and (2) departmental?—Yes.

In all these different kinds of work you have to supervise and watch the work of Native workmen and contractors, and to see that no bad work escapes your attention?—Yes.

There is a constant struggle going on between yourself and your subordinates and the contractors?—Yes.

There is a tendency in contractors to scamp work?—Yes.

Who do you think is best able to check this tendency, the European or the Native Engineer?—The Native.

A Native can watch and prevent scamping and intents to deceive on the part of contractors better than a European Engineer?—Yes.

The Hon'ble Khan Bahadur *Kazi Shahbudin.*

Why do you think so?—Because he knows the people, and has greater opportunities of knowing their habits of work.

Mr. *Nulkar.*

The contractors are generally Natives?—Yes.

Would they be more likely to attempt to deceive a European than a Native Engineer?—I should think so.

The *President.*

Are you speaking of your own knowledge that they have so attempted?—No.

Mr. *Nulkar.*

There are various ways of deceiving?—Yes.

Have you had large gangs of workmen under you?—Not departmentally employed.

Mr. *Nulkar*—contd.

Contractors' gangs?—Yes.

When you said that very few Natives would take advantage of furlough to Europe if it was offered, you were speaking from your past experience?—Yes.

Has not the number of Natives who go to England largely increased of late years?—There is no doubt that a much larger number go than used to be the case.

And if this opportunity were offered, would not the number be still larger?—I should think so.

If they saw that those who have gone have benefited, and that their efforts for self-improvement were appreciated in the Department?—Yes.

The *President.*

You say that comparing all classes of Engineers they are pretty much the same?—I have not noticed any appreciable difference.

Have any Cooper's Hill Engineers served under you?—No.

Or above you?—No.

Then how could you judge of their work?—By observation.

Where were they when you had an opportunity of observing their work?—I have travelled about and seen a good deal.

Have you had any opportunity of personally inspecting their work?—No.

You have worked under Royal Engineers?—Yes.

Is it your deliberate conviction that they are not superior to the ordinary Native Engineer educated in this country as a class?—Their education is superior.

Do you consider that Engineers, educated in England, as a class are not superior to Native Engineers educated in this country as a class?—They are superior.

In practical work?—Yes.

In general education which do you consider superior?—European Engineers.

The immediate supervision of work is in the hands of the subordinates of the Public Works Department, is it not?—Yes.

The duties of the officer known in England as the Clerk of the Works are performed by them?—Yes.

If any fraud is attempted, it must come first under the cognizance of the Native Subordinates?—Yes.

Have you known instances of frauds having been committed notwithstanding this supervision by Native upper subordinates?—None have come under my personal observation, but I have read of such cases.

WITNESS No. XLIX.—*29th July 1887.*

Examination of RAO BAHADUR KÁSHINÁTH RAMCHANDRA GODBOLE, B.A., L.C.E., Executive Engineer, 3rd grade, Public Works Department.

Rao Bahadur K. R. Godbole.

The *President.*

In what capacity did you enter the Department?—As Assistant Engineer, in 1873, in the Roads and Buildings Branch. In 1874 I was promoted

The *President*—contd.

to the 2nd Assistant grade; in 1880 to the 1st grade of Assistant Engineer. In October 1885 I was appointed Executive Engineer, 4th grade,

India.

P. W. Department.

Section III.

Rao Bahadur K. R. Godbole.

The *President*—contd.

and Executive Engineer, 3rd grade, in October 1886.

You have had very good promotion, apparently?—Not bad.

You have gone through five grades in fourteen years?—That is the average run of promotion in the Department. I think some Engineers from Cooper's Hill have got into the 3rd grade after ten years' service.

They entered as 2nd grade Assistants?—Yes. We have to pass an examination every year.

And directly you pass an examination you get into a higher grade?—Yes.

In what parts of the Presidency have you served?—Almost the whole, with the exception of Sind, Kathiawar, and the northern portion of Gujarat. I was for seven years in the Irrigation Branch.

What are the points which you particularly desire to bring forward?—I wish to say that, comparing Native Engineers trained in this country with those who have come out from England, I think the former have some advantages over the latter, one of which is that they know the language and the people better at the commencement of their service, and another is that Native Engineers are better acquainted generally with the resources of a district and with its labour capacities.

That would depend on whether they had lived in the district?—Whatever district a Native Engineer goes to, he generally has greater opportunities of making himself acquainted with its resources; and on account of these advantages I think the young Native Engineer makes himself useful much earlier than the Engineer does who comes out from Europe; and I think that, when employed on works they are in a better position to do them cheaply than a European is.

Can you give us any specific instance in which you have been able to cheapen rates owing to your superior local knowledge?—On the first works I was appointed to, I think I was able to point out to Major Mathews, my superior officer, how the work could be more cheaply done.

Is there any official record of that?—No. From time to time I have done the same with other Executive Engineers.

By letter?—No, in conversation. I do not wish to state it as a general fact, but it is my impression that a young Native Engineer can much more readily make himself acquainted with these things.

Has he not to depend very much on his subordinates?—No, he can make his own enquiries as young Natives generally do. He would get the information in the office and check it for himself by enquiries in the bazar. He lives among the people and speaks their language, and he knows a good deal about the work which is going on in the city and district in which he is working. And as regards practical work, I think the Native Engineers at present in the Department do as good work as is done by Engineers from England. I advocate the larger employment of Native Engineers, because I think they are a cheaper agency owing to their drawing smaller and later pensions, and requiring less leave generally. It has been urged against

The *President*—contd.

Native Engineers that they have no practical acquaintance with English works not having visited the country. I think that disadvantage is to a certain extent being removed by the new ruling of Government, under which a certain number of young men are annually sent to England.

Do you think Natives are as physically strong and capable of endurance as Englishmen?—No.

Do you consider that as a class they are as well educated as the European Engineers who come out to India?—Their professional education for ordinary work is about the same, though in some special particulars the European Engineer may have the advantage. For instance the Stanley Engineer may be better acquainted with iron-work, and there may be some who have made architecture a special study.

For resource in emergencies, for an important bridge or the like, which are superior?—I think the European Engineer, the reason partly being that the Native is afraid of taking so much responsibility on himself.

Do you consider that as a class Native Engineers with the education they receive here are equal to the generality of Engineers who come out from England with a very much higher general education and probably a superior technical training?—I think that in general education European Engineers are superior to Natives.

Do you mean to say that, even supposing their technical education to have been equal, the results of that superior general education will not be shown in the practical application of their technical knowledge?—To a certain extent they will.

Which do you think would build a large railway bridge better?—An Engineer who has had a special training in England would do it much better than one educated out here; but he must have had that special training and special opportunities for making himself acquainted with that kind of work.

Are Natives pretty good at design?—Pretty good in ordinary work in districts which consists mainly of road making and the construction of small buildings. I believe Natives are very good designers. I think all the ordinary work of the Department might well be entrusted to Natives,—that is, to Engineers trained in this country; and for specially large works, such as harbour works, iron works, and architectural works, there should be a special class of Engineers brought out from England.

You would have a mixture of locally-educated Engineers and Engineers from Europe?—Yes.

Amongst Native subordinates are there a good many with a good mechanical knowledge?—I do not think there are a large number, though Native subordinates in this part of the country are a very good class of men.

Would you promote from that class to the superior grades?—In cases of exceptional merit and special qualifications, I would promote from the upper subordinate to the Engineering grade.

How many men took their L.C.E. degree in the same year as you did?—There were four of us. The other men passed, one in the first and two in the second class.

The *President*—contd.

How many numbers did the next successful candidate to you get?—I do not think the difference was more than 60 or 70 out of a total of above a thousand. The other two men passed in the second class. Twenty-three per cent. of the whole was the percentage required in those days in the second class.

There might be a great difference between men in the second and in the upper divisions?—Yes.

Was there much difference on that occasion?—I cannot say.

What was required of the first class?—About 50 per cent. of the whole.

Mr. *Howard.*

Was the 23 per cent. only a pass?—Yes. The percentage is larger now. It is 60 per cent. for the upper and 50 for the second.

The *President.*

Now that the standard is raised, is it desirable to appoint to the R60 grade those L.C.Es. who do not get into the first division?—I would put as many as the service would admit into the higher grade.

From the second class?—No, from the first class only. The present arrangement is, that the two first men, if they come in the first class, enter the Department as Assistant Engineers, the next three as upper subordinates, and the others shift for themselves.

Does it sometimes happen under the present arrangement that men who enter the superior service from the School of Science have as their subordinates their old school-fellows and contemporaries?—It sometimes happens.

Would it not be better, instead of bringing these men in as Overseers, to bring them in as Apprentices?—Much better.

Would they in that case be competent to do Overseers' work on first joining?—I think so.

Have they sufficient acquaintance with practical work, or would it not be better to put them into the Engineer Branch as apprentices?—Much better; but as Overseers they will not be successful unless they are put into a service by themselves. If they know they cannot aspire higher, they will take to their work as Overseers more kindly.

Would men who have received a really liberal education be content to remain as Overseers?—When they found they had nothing more to expect, they would.

Is it desirable, in order to raise the standard of general education among subordinate Engineers, that the B.A. degree should be made a necessary qualification for the degree of L.C.E.?—Very desirable; but for the present I would not demand more than the F.A.

Ought there not to be distinct services for the two different classes of Natives,—that is, a service for the higher educated and another for the less educated men?—Yes.

And in that case you would get a hardier race of men for service as Clerks of Works and that kind of thing and a more educated class for the Public Works?—Yes.

The *President*—contd.

Is it desirable for the efficiency of public instruction in this country that we should endeavour to get our Engineering colleges amalgamated into one college?—I think one central college, really well equipped with professors, workshops, and apparatus for testing, is a very good idea.

Are arrangements being made for sending the students to inspect from time to time large works in progress under the charge of some competent instructor?—Yes. The students of the College of Science are taken out like that now.

They are taken to works in the neighbourhood of the College, are they not?—Yes.

Mr. *Nulkar.*

And sometimes into the district long distances away?—Yes.

The *President.*

Have you had anything to do with Public Works Accounts?—Yes, nearly half my time is spent in keeping accounts.

Do you think that the Public Works Department Accounts Branch might be filled by Native agency to a greater extent than at present?—Decidedly.

Do you think it necessary to have men of high technical knowledge in the Accounts Branch?—I think they should have some Engineering knowledge: not men with the best training, but with sufficient training to be able to find out what materials are required for particular kinds of work. In going over their accounts they have to see whether the prices paid are reasonable.

Have you anything further to add?—I wish to say that I think the furlough rules enjoyed by Cooper's Hill men should be made applicable also to Native Engineers in the Department. At present we are entitled only to two years in our whole service,—one year after ten and one year after eight years' service,—and, moreover, some of our furlough does not count for pension as all theirs does.

Mr. *Nulkar.*

Do you think that if furlough were allowed to Native Engineers, they would take advantage of it to visit large Engineering works in England and on the Continent?—I think so.

Would you go yourself?—I would certainly visit the whole of India, and possibly England. I wish also to say that I think that all the civil and district work of the Department should be done by upper subordinates trained in the College of Science at Poona, and the present practice of employing military men from the Sappers and Miners on civil works discontinued. A subordinate in the course of his duties is required to go to all kinds of outlying places; and a European subordinate in such circumstances has to take with him a small tent, while a Native subordinate can put up anywhere, besides, as a class, knowing the resources of the country better, and in other respects being able to do the work much more cheaply.

The *President.*

Have you had any European subordinates under you?—I have had one or two.

India.

P. W. Department.

Section III.

Rao Bahadur K. B Godbole.

The *President*—contd.

Are Military subordinates largely used for district work?—Not largely, but they are used.

In irrigation?—Not much, but in roads and buildings they are occasionally employed.

Do you find the Native or the European the more wasteful of material?—I think Native subordinates as a class are very careful of their material. Of course there are exceptions. I want to advert to a grievance of Native subordinates in the Department,—that is to say, the high percentage of European appointments. The best way in my opinion to adjust the matter would be to divide these prizes proportionately to the number of European and Native subordinates; for instance, if there are 120 Native and 60 European subordinates, two Sub-Engineering appointments of the first grade might be given to Natives and the rest to Europeans.

Supposing you want more Europeans than that?—Put in more Europeans, but regulate the number according to the higher appointments.

Is there any other point?—No.

The *President*—contd.

The Hon'ble Khan Bahadur *Kazi Shahbudin.*

Do you think that, if more than two L.C.Es. were admitted to the Department annually, the College would attract to itself a larger number of men who have attained degrees in Arts?—I would make passing in Arts a condition precedent to admission to the L.C.E.

By not limiting the number of appointments to two would you get a larger number of graduates to compete?—The service cannot give away any number of appointments; but I think more than two might be given, and that by doing so a better-educated class of men would be attracted to the Department.

WITNESS No. L.—*29th July 1887.*

Rao Bahadur Matand Wamon.

Examination of RAO BAHADUR MATAND WAMON, Temporary Supervisor, Public Works Department.

The *President.*

When did you enter the Public Works Department?—Eighteen years ago, as third grade Overseer. I am still in the Department as Supervisor.

What have you to observe about the constitution of the Department?—Nothing.

On what point do you wish to give evidence? Do you consider there is any ground for the complaint that has been made of the hardships of Native Overseers in respect of promotion to the higher posts?—No, except that promotions are not so freely given as they might be to members of the upper subordinate department in the Engineering Branch.

The rate of promotion in your grade is very slow?—Yes.

Have you received any mark of distinction from the Government?—Yes. I was made Rao Bahadur some six months ago.

The *President*—contd.

Have you been engaged on any large works?—My services were placed at the disposal of the Kolhapur State in connection with the building of a palace and hospital.

Is the proportion of Europeans in your branch of the service too large?—I cannot say.

Have you worked with any of them?—Yes; in the Poona and Kirki offices.

On civil or military works?—On both.

Mr. *Nulkar.*

Have you been engaged on any other big works?—Yes, the Kirki Powder Works.

Any others?—No.

WITNESS No. LI.—*29th July 1887.*

Rao Bahadur V. B. Kannikar.

Examination of RAO BAHADUR V. B. KANNIKAR, 1st grade Executive Engineer (retired).

The *President.*

When did you enter the Department?—In 1849, as Assistant Surveyor and Overseer on R60 a month. I had previously passed in surveying in the old Elphinstone College. I served in Sind for about four years, Poona, Nasik, and one or two of the central Collectorates ten years, and was afterwards transferred to Bombay in the Architectural and Executive Engineer's office.

On what points do you wish to give us the benefit of your long experience?—I only wish to say that the Government should employ more Natives as Engineers, seeing that in India one out of every ten of the works do not require the very great proficiency which would necessitate their obtaining men from England; and that, as a general rule, although the literary attainments of Native Engineers are not equal to those of Cooper's Hill

The *President*—contd.

Engineers, their professional attainments are equal, and they have this advantage, that they know the country; and as all over the country the resources are about the same,—lime, bricks, and mortar,—I say that a person born in this country, if he knows the natural resources of one place, may be supposed to know at least tolerably well the natural resources of the different places to which he may be sent.

The opinion which has been generally expressed by officers in Northern India is that the more useful men for the first five years will be the locally educated men,—do you agree with that?—Yes.

Do you think that greater ability for ordinary work would accompany him throughout his

The *President*—contd.

career?—Yes, because as his experience increases he becomes more and more useful, and, generally, Natives never cease to be students, being anxious to rise to the higher grades. When I joined the Department three or four of us were selected by General Fuller to help him in carrying out the public buildings in Bombay, and General Fuller went so far as to ask Government to make a resolution that we should not be sent out of Bombay, because we were being trained there. I wish also to mention that Natives, having a peculiar gift for reducing rates, do the work more cheaply than Europeans do. In the first place, we have annas, while in England they have shillings, which makes all the difference; we have a peculiar idea of the value of money which Europeans have not; and you will perhaps find that Natives generally succeed in getting work done much more cheaply than their superiors would be able to do without their assistance.

Can you give us any specific instances of that?—One occurred just a short time ago when I was completing the city market at Poona. The people of Poona wanted a very high rate for putting up the roof, so I thought it just as well to get up workmen from Bombay.

Might not that idea have occurred to a European officer?—It might.

Mr. *Nulkar.*

Was not this roof estimated for?—Yes.

By whom?—Colonel Duckett.

Did you succeed in doing it within the estimate?—Yes.

Mr. *Howard.*

Did you advertise for tenders?—There was no public advertisement. Another instance was the Baroda Palace. The rates were very high, and when Major Mant after going to Baroda returned to Bombay and showed us the rates, we pointed this out and made arrangements in Bombay for reducing them.

The *President.*

Did it not occur to Major Mant, just as it occurred to you, that the rates were too high?—Yes, but they never thought of reducing the rates till we went there.

Who never thought?—The Baroda Executive Engineer.

Have you anything else to say?—No.

Are you quite certain?—Quite.

Have you heard what the other witnesses said about the upper subordinate grade?—Yes.

Do you agree with them that there are too many Europeans in the better-paid posts of upper subordinates?—Yes.

Mr. *Nulkar.*

What buildings in Bombay were you employed on?—The new Secretariat.

You built that?—Yes.

The Hon'ble Khan Bahadur *Kazi Shahbudin.*

Were you in independent charge?—Yes. Colonel Fuller was Superintending Engineer and I was his Executive Engineer.

You had to see that the building was built according to the design?—Yes.

What other buildings?—The Elphinstone College.

Have you received any acknowledgment from Government of your services in the Department?—Yes. When the Secretariat was completed and the final certificate sent for the signature of the Secretary, a resolution was passed in which Colonel Fuller and his assistants were thanked by name.

Did you receive any title?—I got the title of Rai Bahadur during the Delhi Assembly.

Did Colonel Fuller visit the work while it was in progress, or did he leave it entirely to you?—He visited it every fortnight.

Was there any other officer there subordinate to him and superior to you?—No.

WITNESS No. LII.—*29th July 1887.*

Examination of W. A. CRISP, ESQ., Temporary Deputy Examiner of Accounts, Public Works Department.

W. A. Crisp, Esq.

The *President.*

When did you enter the Department?—In 1867, as an Accountant, 2nd grade, having been educated in Bombay and having served for two years as an accounts clerk in a Bombay firm, and been subsequently in charge of the accounts in the Municipal Executive Engineer's Office, Bombay.

In your opinion is any technical knowledge of Engineering necessary to the carrying on of the duties of an officer in the Public Works Accounts Department?—I do not think so.

Would some such knowledge be of advantage as enabling the officer to understand the different terminologies in the accounts submitted?—I do not think a knowledge of Engineering is essential; you would soon acquire whatever was necessary.

Then I may take it that Military Engineers

The *President*—contd.

are quite unnecessary in this branch of the Department?—Yes; or Engineers at all.

Have you many in your Bombay office?—We have one just now; he is a probationer; but there are two Cooper's Hill men on furlough. The Examiner is a military officer, who was for a short time in the Engineering branch. He belongs to the Staff Corps.

Do you consider that the work they do might just as well be done by civilians?—Yes.

Mr. *Fernandez.*

How would you recruit the Department?—By selection. At present our superior Accounts Branch is recruited from the clerical establishment, and my opinion is that they are a very inferior

India.

P W. Department.

Section III.

W. A. Crisp, Esq.

Mr. *Fernandez*—contd.

body. Certainly the most of them are not fit to be Accountants. I think there is a large class of educated Natives and of suitable Europeans who could be made available for this purpose. I would have a larger admixture of Europeans than we have at present, because I think it would give a better tone to the Department.

Would you exclude the clerical branch altogether from promotion?—No. For direct admission to the superior branch there should be a certain educational test, while deserving Accountants already in the Department would be promoted on the ground of merit merely. I wish to draw attention to the great disadvantage under which employés in the Bombay establishment labour with regard to promotion. Promotions are made at present by caprice rather than on any settled principle. I joined the Department as 2nd grade Accountant in 1867, and was promoted for special ability within eighteen months, confirmed six months later, but remained in that position from 1869 to 1871, two contemporaries of mine having obtained the grade of Examiner, 2nd class, within that time. I certainly think that the Government of India should call for the names of deserving men from the Bombay establishment with a view to facilitating their promotion.

The *President*.

In making promotions you would have one general list for all India?—Yes.

The Hon'ble Khan Bahadur *Kazi Shahbudin*.

Have you a list of the employés in your Department receiving ₹100 and upwards?—We have

The Hon'ble Khan Bahadur *Kazi Shahbudin*—contd.

altogether fifty-three Accountants in Bombay, out of whom four are Europeans, two of them being non-domiciled. I am a European born in India. I do not consider myself domiciled. We have seven Armenians, five Parsis, five Sindis, two Jews, and thirty-three Hindus in the Department receiving ₹100 and upwards.

Do military officers in this branch of the Department draw the same pay as civilians?—A Major of Engineers, who has just been appointed a probationary Examiner, gets ₹1,400 a month, whereas a civilian holding the same appointment would draw only ₹1,300. By order of 27th September 1886, a restriction has been placed upon the advance of Accountants to the superior establishment. Their promotion is to be limited to the post of Examiner, 4th class, third grade; but, by a singular contradiction of the terms of the order, the very first Accountant promoted has been promoted beyond that grade. He is a Native. With regard to pensions, the civil portion of the service is at a disadvantage as compared with Cooper's Hill and other Engineers who enter this branch of the Department.

Do you not think that the presence of military officers is a gain to the Department, by reason of the higher tone they give the Department, although they do get higher pay?—If you improve the class of civilian employés as I suggest, I do not think there will be any necessity for having military men in the Department.

The *President*.

Have you anything further to add?—No.

WITNESS No. LIII.—*29th July 1887*.

J. O. Wredden, Esq.

Examination of J. O. WREDDEN, ESQ., Accountant, Public Works Department, 3rd grade.

The Hon'ble Khan Bahadur *Kazi Shahbudin*.

When did you enter the Department?—In 1886. I had previously been a clerk in the Aden Executive Engineer's office, and, subsequently to that, in the office of the Comptroller of Accounts, Public Works Department.

On what points do you wish to give evidence? Do you approve of the present method of recruitment?—I think it works very well.

Is any class of the people under a disadvantage as compared to others as regards admission to the Department?—No.

Do you agree with what was said by the last witness? Is it necessary to have Engineers at the head of the Accounts Branch?—There is not much Engineering skill required: a trained Accountant does just as well.

How do the Native Accountants in your office do their work?—Satisfactorily. They are perhaps a little slow.

Slow as Accountants?—Slow in work generally. They potter over the work longer than Europeans.

Is it a defect of the men or of the class recruited?—I do not think there is any other source from which you could recruit unless you establish a college for Accountants.

Have you anything else to say?—Yes. Up to two or three years ago Accountants were

The Hon'ble Khan Bahadur *Kazi Shahbudin*—contd.

promoted according to merit and seniority, without being required to pass any examination. Lately, however, Government have laid down that the subjects prescribed by the Government of India Code shall be passed by every Accountant of the third grade before he can be appointed to the 2nd grade. The subjects of the examination will be found in Appendix C, Public Works Department Code, Accounts Branch. I think this is very hard on the older men in the service, to whom nothing was said about passing examinations when they entered the Department, and who have no time for study. There are two vacancies now in the Accountant grade which are unfilled simply because none of the Accountants have been able to pass this test examination.

Is not this examination in the interest of the Government and the public, though it may clash somewhat with the interests of individuals?—It is; but still I do not think the Government would care to have its servants suffer on that account. Of course the Accountants recently appointed know what they have to expect.

Are any of the subjects of this examination absolutely unnecessary for a good Accountant in the Department to know?—Logarithms; that is the only one which is absolutely unnecessary.

The Hon'ble Khan Bahadur *Kazi Shahbudin*—contd.

Is the study of vernaculars insisted on?—No; it is not necessary.

The rest of the examination is designed to test the candidate's knowledge of accounts, book-keeping, &c.?—Yes; and the older Accountants who desire promotion possess that knowledge although they do not know logarithms.

The Hon'ble Khan Bahadur *Kazi Shahbudin*—contd.

Do you suggest total exemption from examination, or a little relaxation of the rules?—Total exemption in the case of Accountants who entered before the order was passed.

Have you anything further to add?—No.

Sittings at Madras.

WITNESS No. LIV.—*5th August 1887.*

Examination of CAPTAIN C. B. HENDERSON, R.E., Executive Engineer, and Acting Principal of the Civil Engineering College.

Capt. C. B. Henderson, R.E.

The *President.*

When did you enter the Department?—I joined the Public Works Department in 1873 and was posted to the Nellore District as Assistant Engineer, 2nd grade. After I had been nearly five years in Nellore I was transferred to the Nilgherries and afterwards to the Godavery District. I had executive charge from the very first. I am now acting in charge of the Engineering College in the Educational Department. I have been four months in that appointment. I had no previous connection with that institution.

Are you able to give us any opinion as to the merits of the students who were educated in the College before you took charge of it?—Many of them have served under me, but I have had no opportunity of observing them during the course of their studies.

Do you consider that the College offers sufficient facilities for the education of Civil Engineers?—Out of the four months I have been in charge, two were vacation and the other two have been chiefly taken up by examination.

Do you know the course of study there?—Yes; and I consider that the education given to students in the Assistant Engineer classes is sufficiently high theoretically.

Can you compare it with the education given at Woolwich?—The education given at Woolwich is not so much for Engineers as for officers of the artillery.

But there are several branches of study which would be common to both?—Yes; Surveying, Mathematics, and Drawing.

Do you know Cooper's Hill at all?—I have never been there, but I have had many Cooper's Hill men under me.

You know the curriculum at Cooper's Hill?—I do not know that I do.

Do you consider that any addition is necessary to the curriculum at the Engineering College here?—Not, so far as I have seen it, and the practical course after the students leave the college ought to be sufficient to turn out good men. The two combined ought to be quite sufficient.

Under the new rules, on leaving the College, they will be sent for two years' practical work?—Yes. The theoretical course will be longer,—that is, it will be a three years' one,—and the two years' practical course will make it five years in all. After three years they will draw pay.

The *President*—contd.

Can you tell us on what model this scheme has been framed?—It was drawn up by a committee appointed for the purpose.

In forwarding the new rules to Government, was any letter sent explaining the reasons for protracting the course to five years?—I do not know.

Hitherto the course has been a two years' course?—I believe so.

Do you consider it desirable that the education for the supervising and for the subordinate grades should be given at one institution?—The candidates for the supervising branch are so few that you could not afford to have a highly-paid staff only for them.

There are now four Engineering Colleges in India: it has been suggested that we should have one great Engineering College for all India in which candidates would be trained for the supervising branch, and three lesser colleges for the training of subordinates. What do you think of the scheme?—There is this to be said, that the procedure and practice differ so much in the different presidencies—I mean there are different languages and different ways of working.

Is not the language in which instruction is conveyed the same in all the colleges,—*viz.*, English?—Yes.

In what respects does the procedure differ?—I have been in the Public Works Department of Northern India, and it struck me that their system and style of work was different from ours. They employ contractors very largely in Northern India, and more work is done by contract there than here.

That would not affect the Engineering work, would it?—The Engineer here is an executive officer and has to provide almost for everything, to go into every detail, whereas in Northern India it is the contractor who goes into details.

In this Presidency are public works which are paid for at the cost of the Local Fund Boards executed by the Public Works or by the Local Boards?—A very few are carried out by the Public Works, but generally the Local Board has its own Engineer and establishment quite independent of the Public Works.

What contract work would they do in the North which would not be done by the Public Works here?—The upkeep of roads is largely done

India.

P. W. Department.

Section III.

Capt. C. B. Henderson, R.E.

The *President*—contd.

by contract in Northern India. I have not met with any instance of the maintenance of roads in this Presidency by contract.

Do you know anything about the irrigation works of the North-West?—No.

Is the objection you have mentioned the only one which occurs to you at the present moment against centralizing the higher education in Engineering?—I think also that the Natives would object to leave their own Presidency to go to distant places.

Are you aware that Natives from this Presidency and from Mysore are found in the Dehra Dun Forest School?—No.

Do you know that Natives of Burma, of the North-West, and of Bombay attend the Agricultural College at Saidapet?—Yes. But they complain very much of the expense they are put to by having to come to Madras and live here, and I should have thought that their difficulties would be increased by going further.

How many students are now attending your College?—About 170.

How many are qualifying for the Civil Engineers?—About fifteen.

What are the others doing?—Qualifying themselves to become Overseers. The proposed Maistry and Artisan Classes have not yet been formed.

Have you in the course of your executive service had among your subordinates men who had been educated in Indian Civil Engineering Colleges?—Yes; a great many.

How did they work?—Fairly well after two or three years' experience. They were not of much use at starting.

Have you had under you Europeans and Eurasians as well as pure Asiatics?—Yes; men of all classes.

Which did you consider the best?—I think Eurasians could stand the sun better than any, and they were stronger than the pure Asiatics; Europeans broke down more quickly up country than Eurasians.

Are you referring to Europeans born in the country?— To Europeans of both kinds.

Have you had any Stanley Engineers under you?—No.

Have you had any Cooper's Hill men under you?—Yes.

How did they work?—Very well indeed.

Were they of any use when they first came to the country?—They required some help at first, but after a year they gained experience.

As a class which had the better technical knowledge—the men educated here or in England?—The men educated in England.

Comparing the best of the two classes which were superior?—Those educated in England.

In what respect?—They were better Engineers, I think.

In which branch of their work?—Designing and organizing.

Which got the better work out of their subordinates?—The men from Cooper's Hill, I think.

The *President*—contd.

Were they sufficiently acquainted with the language?—After a year or two they became so.

The opinion which was expressed to us up country was that the best of the locally-educated men were equal to the best men from Cooper's Hill, but that the average were inferior. That is not your opinion?—No.

How many men from any place have you had under you whom you could call really good men?—I should think about a dozen. I have been fourteen years in the Department.

How many of these had been educated in this country and how many in England?—During that time I had six men from Cooper's Hill serving under me, and they were all good Engineers; there was not a failure among them. The others were all temporary Assistant Engineers appointed in this country, and were fairly good men. One was a very good man; he was a Sub-Engineer and afterwards promoted to an Honorary Assistantship.

Was he as good as the average of your Cooper's Hill men?—I think not.

Where did he fail?—He could not design anything.

What designs did you employ these Cooper's Hill men on?—Designing small irrigation works, tank sluices, surplus weirs, small bridges.

And what did you employ the locally-educated man on?—The same works. He could design, but not well.

Was he a Bachelor of Civil Engineering?—No.

Have you had any Bachelors of Civil Engineering under you?—One, for a short time.

How did he work?—He was appointed Overseer, and I think was not very satisfactory.

Where did he fail?—He was above his work; he disliked being Overseer.

As an Engineer how did he do?—Fairly well.

Have you had any reason to think that Cooper's Hill men are wanting in subordination and discipline?—No; personally I have had nothing to complain of in Cooper's Hill men.

Have you anything to suggest as regards the constitution of the Department?—No.

Why is it necessary to appoint military non-commissioned officers to this Department?—In case they have to go on active service they are employed for making roads and temporary bridges, and are very useful. I have found on active service that men of this class who have been in the Public Works are much more useful than those who have not.

There is no separation between the Military and Public Works in this Presidency?—No, nor would such separation be possible in my opinion, there being no sufficient military work to find employment for separate officers or a separate staff of men. I was myself in charge of the Wellington Barracks together with a ghât road. The work of laying down the road might, it is true, have been performed by a civil establishment, but a ghât road is precisely the class of work in which we desire to exercise our military subordinates.

Mr. *White*.

I suppose your experience of Cooper's Hill men is confined to the little they did under you when you were Executive Engineer, and that you cannot speak as to their capacity for passing examinations in this country such as are prescribed by the Code?—Oh yes. I have been on Boards for examining them and I have been an examiner in special instances.

Is it not true that the young Engineers from Cooper's Hill take a longer time to pass these examinations than Natives do?—All the gentlemen from Cooper's Hill who have been examined by me have passed the first time; one Native was examined by me and failed very badly the first time, though he passed on a second attempt a year afterwards.

Mr. *White*—contd.

Did you examine any Native Engineers?—Only one.

You said the Cooper's Hill men passed the vernacular languages in about a year or so?—I said that all the Cooper's Hill men who were examined by me in professional knowledge passed the first time.

Do you know the nature of the vernacular examination for the third class?—I have passed it myself.

It is not a stiff examination?—No, it is easy.

Are you aware that there are Cooper's Hill men who have been in the country 11 years and have never been able to get through that examination?—Yes.

From Captain C. B. HENDERSON, R.E., Acting Principal, College of Engineering, Madras, to the Secretary, Public Service Commission, Fort Saint George,—No. 195 C., dated 12th August 1887.

I have the honour to forward herewith the statement requested, showing the number and character, &c., of the students at the College of Engineering.

2. I regret that I am unable to send a copy of the Government order in which the abolition of the "Engineer" classes at the College was ordered. It appears that the Government order was cancelled, and all copies withdrawn and destroyed.

College of Engineering, Madras,—Classification of Students on the rolls on 31st March 1887.

Classes	Number of students.	Classification according to Race or Creed.								Classification according to Wealth.			Occupation of Parents or Guardians.								Numbers supported by Scholarships, &c.		
		Europeans and Eurasians.	Native Christians.	Mahomedans.	Hindus.				Others.	Richer classes, drawing an annual income of Rs5,000 and upwards.	Middle classes, drawing an annual income of Rs200, but less than Rs5,000.	Poorer classes, drawing an annual income of less than Rs200.	Officials, i.e., those engaged in office work, public or private, drawing annually not less than Rs200.	Petty officials and menial servants.	Traders.	Landholders.	Artisans.	Coolies, including agricultural labourers.	Mendicants, including orphans charitably supported.	Others.	Holders of Government Stipends and Scholarships.	Holders of Free Scholarships.	Holders of Private Scholarships.
					Brahmans.	Vaidyas.	Sudras.	Others, including Pariahs.															
Engineer's classes . .	17	2	...	..	12	...	3	...	...	1	16	...	8	1	...	7	...	...	...	1	2	...	3*
Engineer Subordinates' classes	63	13	6	1	30	...	13	...	...	1	55	7	27	1	2	25	...	...	...	8	10	1	1†
Draftsmen's classes . .	59	3	5	...	17	...	34	..	..	1	38	20	30	1	7	20	1	...	...	...	7	1	...
Surveyors' classes . .	42	6	1	1	20	...	12	1	1	1	29	12	20	3	3	16	...	...	...	..	7	1	...
Total .	181	24	12	2	79	...	62	1	1	4	138	39	85	6	12	68	1	...	...	9	26	3	4

* Mysore, Travancore, and Cochin Government Scholarships.

† Francis Cotton Walker's Scholarship.

C. B. HENDERSON, *Captain, R.E.*,
Acting Principal, College of Engineering.

MADRAS,
12th August 1887.

WITNESS No. LV.—*5th August 1887.*

India.

P. W Department.

Section III.

C. Vincent, Esq

Examination of C. VINCENT, ESQ., Executive Engineer, third grade, Public Works Department.

The *President.*

How did you enter the Public Works Department?—By a competition in which there were over two hundred competitors for fifty appointments. I entered under the original regulations for Cooper's Hill. In those days there was a competitive examination for admission to the College, and all the students were intended for the Indian Public Works. They contemplated giving fifty appointments a year.

How long was the course you went through at Cooper's Hill?—Three years—two years' theoretical and one year's practical. I came to India in 1874. Most of the students have a longer practical course now. They can remain an extra year in England receiving a certain salary.

Had you to pay fees in those days?—Yes; £150 a year. The rate is now £180 a year.

On your arrival in India, where were you posted to?—North Arcot as Assistant Engineer, second grade; that was the grade which was guaranteed to men who passed out of Cooper's Hill in those days.

Mr. *Ramaswami Mudaliyar.*

What salary do second grade Assistant Engineers get?—R350, and R250 in the third grade.

The *President.*

What work were you engaged upon on first appointment?—Re-building a bridge. I was five years in the North Arcot District.

What other works were you engaged on during those five years?—Only the general works of a Public Works officer—nothing special. After that I came to Madras as Under-Secretary.

Have you had other District experience than the five years you have spoken of?—Yes, during the last two years. I am now in charge of the Buckingham Canal.

Have you at any time of your service had under you Bachelors of Civil Engineering of the Madras University?—Yes. I had one in North Arcot.

How did he work?—I had not a very favourable opinion of him.

In what did he fail?—In activity.

Was he an Asiatic Native or a Eurasian?—An Asiatic, a Hindu.

What work was he employed on?—Principally on tank repairs.

Have you had any men under you who were educated in the Madras Engineering College?—I have one; I am not quite sure that I have not got two.

Are they Bachelors of Civil Engineering?—Neither is.

Mr. *Ramaswami Mudaliyar.*

How long was the Bachelor of Civil Engineering working under you?—About a year.

As what?—Assistant Engineer.

The *President.*

Have you served on the Committee of this Engineering College?—No, but I have been an Examiner.

How often?—When I was in Madras I was an Examiner yearly.

In what subjects?—In several subjects: Mathematics, Surveying, Engineering.

As an Examiner, what opinion did you form of the capacity of the better class of pupils in the Engineering Class?—They were disappointing.

In what subject did they fail?—I do not say they failed, but that they were disappointing in all subjects. There were very few good papers, and a great many only moderate ones.

What was the percentage of marks required for a pass?—I do not know.

(The Departmental Member here observed that the University Examination for the Bachelors of Civil Engineering degree was a separate examination and of a more purely Engineering character than that of the College; that the College examination took into account a certain number of term marks which of course the University examination did not.)

The *President.*

Have you any views to urge regarding the subject of the present enquiry?—Yes. I have embodied my opinions in a note (*reads*): —

I do not consider that any largely increased admission of Natives to the gazetted ranks of the Public Works Department is possible, for two reasons:—

(1) The unsuitability of Natives for the work required of them.

(2) The difficulty of giving them a proper education even if the material were available.

The ideal Public Works officer should excel in the very qualities in which the general run of Native is most deficient. He should be active, fond of riding, indifferent to the sun, inured to exposure, resourceful under difficulties, prompt at coming to a decision, or not afraid of assuming responsibility. There are constitutional and ethnological reasons why none but exceptional Natives should combine these qualities, or indeed possess many of them. It is true that there are some excellent Native subordinates in the Department, but subordinate officers have, as a rule, only one

The *President*—contd.

work or group of works to look after, and are not often expected to act on their own initiative.

But even if the necessary class of men were available, it would be difficult to educate them in India up to the required standard. The Department is now mainly recruited by young officers of Royal Engineers and by students from Cooper's Hill. Both of these receive a highly specialised and elaborate training, to the standard of which it would be impossible to attain in India. I have been to Rurki and have a general knowledge of the system of education there. I am also acquainted with the course of instruction given at the Madras Engineering College. The former is probably the better system of the two, principally because they have large irrigation works and workshops close at hand, which serve to teach the students practical work. In this view the Madras College would probably be better located at Dowlaisawaram on the Godavari than in Madras. Both the Rurki and Madras systems are good enough so far as they go, but they do not and cannot go far enough to replace the English training. It is as impossible to compare the education given at Chatham or Cooper's Hill with that given at Rurki or in Madras, as it would be to compare the educational facilities of Oxford or Cambridge with those of the Madras University. No doubt Rurki turns out some good men, and owing to their knowledge of the country and its language they start with a great pull. But the best Royal Engineers and Cooper's Hill Engineers will, I take it, eventually be always ahead of the best Rurki men. I have assumed in the above remarks that Natives will not be found willing to go to England to be trained. The number of those who have been found willing to go through the Cooper's Hill course is extremely small, and no Madrassee, so far as I am aware, has ever attempted it. Nor is this to be wondered at. The period of training is very extended and expensive, and the mode of life at the College would be very irksome to a Native.

On both grounds, therefore, I do not look hopefully on any considerable increase of Natives to the Engineering grades of the Department.

Natives, as I have said, often make excellent subordinates, and those who enter the subordinate ranks deserve better treatment than they at present receive, and the senior Native student of the Engineering College who obtains the degree of Bachelor of Engineering at the Madras University Examination is now annually made an Assistant Engineer. No doubt this acts as an incentive to young men to enter the College, and to work hard while there, and has therefore much to recommend it. But it is a great chance whether the student so selected develops into a capable Engineer, and I confess I would far rather see a similar promotion given annually from among the ranks of the Native upper subordinates, whose capacity can be accurately gauged and who sadly require a little stimulus to their zeal. Their lot is at present a hard one. On passing out of the College all military students are made Overseers, 1st grade, on a salary of ₹100, and if there are no vacancies in the grade they are made supernumerary. Other students only take rank below them and do not get promotion until

The *President*—contd.

the military supernumeraries are absorbed. Their promotion is thus very slow, and the upper grades of the upper subordinate establishment are almost wholly closed to them. I find on examining a recent list that out of nine 1st grade Sub-Engineers not one is a Native; out of nine 2nd grade only one; out of seventeen 3rd grade only seven, or a total of only eight out of thirty-five. Domiciled Europeans also take advantage of this system by enlisting in the ranks of a British regiment, spending six months in it, and then applying for admission to the College, and so obtaining a 1st class Overseership as a matter of course, to which it can scarcely be maintained they are fairly entitled. The military subordinate class is one it is very desirable to maintain, but the fair way would be to have separate promotion lists for military and Native subordinates with a *pro ratâ* share of the upper subordinateships allotted to each. Then if a yearly or occasional promotion to Assistant Engineer were to be given to the most deserving among the Native Sub-Engineers, a real incentive to excellence would be created. This would cause no hardship as regards the military subordinates, for they get promoted, as a matter of course, to Assistant Engineer when they become Assistant Commissary.

The position of draughtsmen in the Department also requires to be improved. There are at present three grades of draughtsmen who obtain their certificates from the Engineering College. Their salaries are:—

	₹
Special class . . .	80 to 100 a month.
1st grade	50 „ 70 „
2nd „ . . .	35 „ 50 „
3rd „	20 „ 30 „

The draughtsman is or should be the most important member of an Engineer's office establishment, and the complaint is general that good draughtsmen are impossible to obtain. Nor is this matter for surprise when the rates of salary are considered. Very few men care to go in for the work, and those who do go in for it are not generally of the best class. In my opinion, the rates of salary should be considerably augmented, and the pass examination made considerably more strict. I look upon these as points of great importance, in which I am sure all executive officers will agree with me.

When you speak of Natives I presume you refer to Natives of Asiatic parentage?—Yes.

Have you considered whether there are or are not in this country many Europeans and Eurasians to whom the objection on physical grounds which you take to the employment of Natives in the Department would not apply?—No; It would not apply to Eurasians.

Nor to Europeans?—Not to some.

Are not Europeans born in India fond of riding, active, indifferent to the sun, and inured to exposure?—I think the objections I have mentioned would apply to most of them.

India.

P. W. Department.

Section III.

C Vincent, Esq.

The *President*—contd.

Would you say that these gentlemen (*names them*) were not as active, fond of riding, and indifferent to the sun as Europeans born in England?—The domiciled Europeans we have experience of are those who have enlisted in regiments or are men of the class who enlist; but what I have said was intended to apply to Asiatic Natives.

Why should you exclude the other classes?—Very few could be found to go through the College.

Do you think we have no men in the Indian service who are competent to teach Engineering?—We have not a sufficient number to form the staff of a college.

Would it be impossible out of the existing Engineering staff in India to provide the tuitional staff necessary to equip a first-class Engineering College?—It might be done by altering the existing conditions of the service.

If there were one high-class college in India instead of four?—Even then I do not think you could come up to the English standard. The professional staff of Cooper's Hill are men of European reputation.

Is it not the case in all professions that men learn most when they apply their acquired knowledge to practical work?—Yes; but I look at Engineering as specially requiring the most excellent theoretical training; and if you do not get that training early you do not get it at all.

Have you ever heard it asserted that the best Engineers as a class were those obtained under the Stanley system?—I have.

Do you agree with that opinion?—My experience is that the best Engineers India has had have been Royal Engineers.

Stanley Engineers were originally selected from men who have had practical experience in England?—Yes.

Is there not a defect in the Cooper's Hill system which is identical with the one which you impute to the appointment of a single man from the Madras College,—*viz.*, that however good the education may have been, it may be that the man himself has not any natural aptitude for practical work?—I do not think so; because, *cæteris paribus*, the chances in the one case are very much higher than in the other of the student turning out better.

You know that some of the students from Cooper's Hill have not turned out satisfactory?—Yes; a great many have not.

They have had the very best education?—Yes.

Is not the objection which you take to the conferring of an appointment on the best student at an Indian Engineering College one which could be taken against a system of recruitment from Cooper's Hill?—In principle it is, but it is different in degree.

There are two classes of work in your Department: the ordinary small works of a district and the more important works requiring considerable Engineering ability. Is there any reason why we should not have separate departments, one for the ordinary public works of the district and another a highly-paid agency at headquarters for carrying out works of extraordinary importance?—I think it would be a most excellent thing. At present men in the Department who are fond of Engineering have their enthusiasm spoilt by having to do a great deal of petty work.

The *President*—contd.

Do you know that in Northern India Native Engineers are employed on important railway works, on eight-mile sections of line?—I think there are one or two very good men among them.

Eight miles would be a responsible charge?—That would depend very much on the nature of the works.

Do you know that Native Engineers are employed on sections of the Eastern Bengal Railway in charge of large bodies of men?—They would correspond with our subdivisional officers. Natives are very good subordinates.

What would be the average charge of an Executive Engineer on railway works?—About 100 miles; but it would altogether depend on the description of the work.

Have you any Native Executive Engineers in this Presidency?—Yes; one.

Mr. *Ramaswami Mudaliyar.*

On what do you base your opinion that Natives are unfit for the higher appointments in the Department; is it on the way in which you have seen them work as Overseers and subordinates?—Yes.

Is it a fact that the generality of Overseers do not know how to ride?—They are very bad riders.

And that they are afraid to expose themselves to the sun?—They very often show a tendency to that.

Is it not they who really attend to the progress of the work?—It is their duty certainly.

Do they not do so?—Speaking generally, there is cause for complaint.

Speaking generally, they do not expose themselves?—Yes.

You have no experience of Natives as Assistant Engineers?—I only knew one Native Assistant Engineer.

Have you had Mahomedans under you?—One.

Are Mahomedans averse to riding also?—The one I have mentioned was not.

Was he afraid to expose himself?—No; he was a very good man.

How many Overseers have you had under you?—A great many, during the Famine especially; it would be impossible to say how many.

It is not the Overseer class that rise to these high offices?—No; but they come from the same class; they all pass through the Engineering College, the only difference being that the Assistant Engineers happen to pass out highest.

WITNESS No. LVI.—*5th August 1887.*

Examination of S. D. PEARS, ESQ., Executive Engineer, fourth grade.

The *President.*

When did you enter the Department?—In 1880. I was educated at Cooper's Hill. I served in the Kishna District for about five years, and subsequently in Nellore, Vizagapatam, and Godavery.

Have you had any Bachelors of Civil Engineering educated at the Madras Engineering College serving under you?—Three or four, Asiatic Natives every one of them.

What opinion did you form of them as a class?—Their technical knowledge was very good—that is, their book-knowledge.

And as to their practical work?—As subordinates they have been without exception above their work.

Were they Overseers?—They were Supervisors.

What have you to say of their practical efficiency as Engineers?—They had no idea of discipline at all; and I think they failed in design. Until they had had practical experience for two or three years they were not of much use. On construction they could not correct a mistake that they saw a bricklayer make.

Is not that a common fault of all young Engineers?—Yes.

How are they in survey work?—They vary very much. My work has been almost entirely in irrigation.

How do they lay out their distributaries?—One of them was quite the best man I ever came across for that; I think he was as good as a Cooper's Hill man in laying out small projects and aligning canals; but he could not design sluices or bridges.

Did he seem to know a good piece of brickwork when he saw it?—No. He was four years under me and learned very slowly.

The *President*—contd.

Have you ever had a Eurasian or domiciled European under you?—I have had Europeans, but not Eurasians. I do not know whether they were domiciled or not. Some of them had passed out of the Engineering College.

How did they do their work?—Not so well as the Natives.

In what respect were they deficient?—In their command of labour; they could not collect labour: if a hundred coolies were required at an hour's notice a Native subordinate could get them, but the European could not.

Would Cooper's Hill men have been any better in that respect?—No; but it is not exactly in their province.

Were the men you speak of military subordinates?—All but one were: they were both Overseers and Supervisors.

How have Native subordinates done their work under you?—Very well on the whole: better than European subordinates.

Did they show any special talent for irrigation works as distinguished from roads and buildings?—No.

Were there not large irrigation works in the country before the advent of the British?—Yes.

How do you imagine they were constructed if Native Engineers are not competent to have charge of such works?—It is quite unintelligible to me, and I do not think they could do works of that kind now.

Have you anything to observe as to the constitution of the Department?—No.

WITNESS No. LVII.—*5th August 1887.*

Examination of J. W. H. ELLIS, ESQ., Honorary Assistant Engineer, first class.

The *President.*

When did you enter the Department?—In 1861, as Assistant Overseer from the Madras College of Engineering. There were no Bachelors of Civil Engineering in those days. I served for four years as Assistant Overseer in the Kurnool, Bellary, Cudapur, Ganjam, Godavery, Chingleput, Kanara, and Salem Districts.

Have you any observations to make on the subject of our enquiry?—Yes; I have set out my views in a note (*reads*).

I passed out of the Madras Civil Engineering College in May 1861, standing first in my term of fifteen students and receiving first prize in every subject except Engineering and second prize in that. Then, as now, appointments were not guaranteed to civil students, and it took me till October before I obtained an Assistant Overseer's post of ₹80 a month with travelling allowance of ₹1½ a day. I first served in Kurnool District. Here I relieved Mr. G. Leggett, a second Assistant District Engineer of the Cumbum Range, and did that duty as an executive for a period of ten months, when in turn I was replaced by a first

The *President*—contd.

Assistant District Engineer, Mr. J. George, who leaving in a few months I again held executive charge and gave over after a few months to first Assistant District Engineer Mr. W. B. Leggett. I served under this officer for some time, and on his removal in reorganisation of 1863 I was again put in charge of Cumbum Executive Range, which I finally gave over to a Supervisor, Mr. Bance. I have given the above statement to point out how my services, though only an Assistant Overseer at the time, were made use of, for above one year, to do the work of an Executive. That I gave satisfaction my testimonials assert. I will point to my work in this district; the Nandikanamah Ghât, through which a railway is now being laid, was finished by me.

2. Military students of the colleges at all times were guaranteed appointments, and in my early service had a great deal more advantages given them than to civilians. In most cases—I should say all they obtained appointments while in the—last months of college life, and thereby became the seniors of more worthy civilians, as in my case.

India.

P. W. Department.

Section III.

J. W. H. Ellis, Esq.

The *President*—contd.

Now prospects are still more serious with the civilian. No matter how well he may pass out or how high he may stand at the final test, still he can only enter the Public Works Department as an Overseer of the last or 3rd grade, and this is not guaranteed to him. The military man, no matter how he passes and how he stands in the same list, enters upon his appointment as a first grade Overseer, and this is guaranteed to him. And therefore the civilian from the beginning is heavily handicapped; and this accounts for the subordinate branches of the Public Works Department not being sought for by intelligent college-boys.

3. Promotion in the subordinate grades goes by merit, and this may mean anything, as it has turned out in various instances, of true merit being rewarded, or master's favour forwarded.

4. To go on with my own case, and which will serve as a typical one. I am one of those who have failed to gain admission into the upper or Engineering rank. I served in Kurnool, as I said before; in Bellary, Cuddappah, and in Ganjam. Here in the last district I relieved Assistant Engineer Mr. T. D. Harris of the Chilka Lake Canal, then in its first stage of operation, and completed the whole canal myself, saving R60,000 on the estimate. From beginning to end of this work I was a 2nd grade Supervisor. I was also employed to assist Major Beekly, R.E., in the investigation of the Rusakulia project. This work has since been sanctioned and partly carried out.

5. During the deficit of 1869-70 I was ordered to the Godavery District for special duty there, and after one month's surveying and levelling under Mr. J. W. Rundall, Executive Engineer, I was ordered to relieve a Mr. Simon, Executive Engineer of the 3rd grade. And I, only a Supervisor, 2nd grade, at the time, was put in executive charge of the important section of the Godavery District, the Central Delta; and held it continuously for 11 years, April 1870 to March 1881. In all except pay and allowances I was an Executive Engineer under the immediate orders of Superintending Engineers Colonel Fischer, Beatty, and Mr. Walch. How I did the work of this delta, both administrative and executive, the following G.Os. and testimonials will show. See memorials A and B.

6. In 1871 I was recommended for an Assistant Engineer by Colonel Fischer, Superintending Engineer, and G.O. 52, alluded to above, promised such advancement to me; and Colonel Beatty on 28th January 1878 also recommended me for the same promotion.

7. During my tenure of the delta I prepared its completion project of 9 lakhs of rupees while holding rank as Supervisor and Sub-Engineer. This project has been sanctioned, and the first officer put on to carry it out was Captain Dorward, R.E., and Executive Engineer; and therefore I was for 11 years in the delta doing an Executive Engineer's work. All my predecessors here were Executive Engineers and all my successors also Executive Engineers, and I did the work as effectively, or I would have been turned out of it, being an Eurasian, and therefore a subordinate. The increase in cultivation in that delta rose from 82,000 acres to nearly 100,000 acres wet land in my time. As I said, the completion project of 9 lakhs of rupees was my work, also the embankment of Polaram Island. I prepared the river charts for all the three deltas, and was in many ways a very useful and deserving member of the subordinate branch of the Public Works Department, as certified by Colonel Beatty and Colonel Mullins, the then Chief Engineer for irrigation, who has borne high testimony to my worth. See G.O. No. 3822 W., dated 30th September 1878.

8. In 1878, when Mr. G. Walch was Acting Superintending Engineer, a great catastrophe took place in my Central Delta. Its supplying-sluices, a large structure, gave way, and the river poured 17 feet of water into a large canal, the main duct, and turned the delta into a mighty lake. What I then did is clearly shown in G. O. 3822 W., dated 30th September 1878. For this I was paid a bonus of three months' salary, and promises of further advancement held out to me, and the Government is still fulfilling this. And as I then was Sub-Engineer, 1st grade, my only prospect was in the upper ranks.

9. In 1881 March, I was transferred to the Buckingham Canal on special duty to prepare the completion project of this canal for its full length from the Kristna District to near the Coleroon. The out-door work was supplied to me by another very deserving upper subordinate, Mr. Ottmann, who, like myself, is a sufferer from the same prejudice against Eurasians. I did all the in-door work of estimates and designs, and this came to a total of about 36 lakhs of rupees. The work is now being carried out. The Madras Basin Wharf is my design and part of the big estimate, and so are all the locks, flood-gates, outlets, and inlets of the canal. Taking all my good work into consideration, Government could not put me off, and at last in 1881 I was recommended with Mr. Ottmann, both Sub-Engineers, first class, to the Government of India for permanent promotion to Assistant Engineers, first grade. How this fared, G.O. No. 2529, dated 17th October 1881, referred to, my memorial B. will show. We Eurasians were left out because we were "not pure Asiatics," "not Natives of India." Hitherto the prejudice against us was that we were not Europeans, and now we are "not Natives" or "pure Asiatics," as defined in that G.O. Our work, however, was appreciated in the meanwhile, and though subordinates in position and salary, we were still put to higher duties as occasions required us.

10. Finally, I again memorialized, and this time to the Secretary of State for India. See B. The Government of India acknowledge the disadvantages the civilian subordinate suffers under, and to make up for these held out prospects of temporary promotions. Even these were eventually deprived us, and outsiders entertained in appointments which ought to have fallen to us.

Cooper's Hill College is not necessary for India; it is not the proper recruiting ground for the Engineering requirements of India. We have our Indian Engineering Colleges for all purposes, and if Cooper's Hill College is necessary, why then train Engineers in India? If Indian colleges are required, Cooper's Hill ought to go. One must give place; there is no field for both, and if both are kept up I would suggest that Indian colleges have the bulk of the appointments appropriated to them, while Cooper's Hill should only get $\frac{1}{3}$ or $\frac{1}{5}$ the number of appointments; whereas now Madras has only one guaranteed annual appointment—far too little for its encouragement.

The *President*—contd.

Our Indian colleges can train men of sufficient attainment; its standard may be raised if necessary, and instead of Indian lads going to England for their education in Cooper's Hill, English lads intending to enter Indian service should come out to India to join our Indian colleges and train here. Both Native and European passed students may be sent to England after their college course here and at their own expense for a year's practical training in England. This to be optional.

Captain *Baddeley.*

How was the Department organized at the time when, as you say, you held executive charge without being appointed or drawing the pay of an Executive Engineer?—We had divisional officers as Superintending Engineers.

You held the charge of an Executive Engineer?—Yes. I was a subdivisional officer when Captain Henderson was an Engineer.

Such a thing would be impossible now?—Yes.

Mr. *Ramaswami Mudaliyar.*

Have you known other cases of Supervisors and Sub-Engineers doing the work of Executive Engineers and holding charge of divisions?—Yes; many.

For long or for short periods?—For considerable periods.

Captain *Baddeley.*

How long ago was that?—Not since the reorganization of the Department in 1879-80.

The *President.*

Is the Central Division of the Godavery State an executive charge?—Yes.

Was any complaint ever made against you that you were insubordinate?—Never.

Or that you could not stand the sun?—It would be impossible to say that of me.

Have you always enjoyed good health?—I never had a serious illness during the whole course of my service.

Mr. *Ramaswami Mudaliyar.*

You ride well?—Yes.

Do Hindu and Mahomedan Overseers know as a class how to ride?—Yes.

Have you ever known an Overseer who did not?—No; I should have got rid of any Overseer who did not.

An Overseer has to expose himself a good deal?—Certainly; he must do so.

The *President.*

To a greater extent than a controlling officer?—Always; the controlling officer usually returns to his camp at latest about 10 o'clock A.M., whereas the Overseer remains till 5 or 6.

Have you had any gentlemen from Cooper's Hill serving under you?—No.

Mr. *Ramaswami Mudaliyar.*

Do all the gentlemen from Cooper's Hill know how to ride when they come here?—I do not know.

Mr. *White.*

You got the thanks of Government for the work you did in the Godavery district?—Yes (*reads the thanks of Government*).

Did you get any credit for the work you did on the Buckingham Canal in the letter that went to Government?—I do not know.

What reply did the Secretary of State make to your memorial?—I did not receive any reply, and I do not believe the memorial was forwarded. The memorial was sent on to the Government of India, and they put forward this plea about my not being a pure Asiatic, but they asked the Local Government to give me temporary work on any of the railway or survey schemes in operation, with the condition, however, that if I accepted such employment I was to withdraw my memorial. I accepted the employment offered, but continued to request that my memorial should be forwarded. I have heard nothing more about it since.

They never gave you the temporary Engineership they offered you?—No.

And they made you an Honorary Assistant Engineer?—Yes.

What does this word "honorary" mean?—I do not know.

Does it not mean "no gentleman"?—I do not know. It means that I am to a certain extent superior in rank to a Sub-Engineer, but have not the status of an Assistant Engineer. I receive the pay of a Sub-Engineer and the allowances attached to the honorary rank.

Is that term "honorary" a popular one?—No. I wished to decline it, but I thought my offer would not be accepted. I accepted it against my inclination.

The *President.*

Have you anything further to say?—No.

WITNESS No. LVIII.—*5th August 1887.*

Examination of SUBRAMANYA SASTRI, ESQ., 2nd Grade Overseer.

Subramanya Sastri, Esq.

The *President.*

Where did you receive your technical education?—I was educated at the College of Engineering here, and joined the Department as an Overseer.

What have you to say in regard to the subject of this enquiry?—I have put my views in the form of a note which with the Committee's permission I propose to read (*reads*).

The *President*—contd.

Engineer Branch.—There are 89 men in this Branch, of whom only 5 are Natives. The Committee appointed under G. O. No. 2160 of 22nd August 1871, recommended three appointments of 2nd class Probationary Assistant Engineers, on a salary of R150 per mensem, being given every year to the three best students of the Madras Civil Engineering College, and the promotion of these men, if

India.

P. W. Department.

Section III.

Subramanya Sastri, Esq.

The *President*—contd.

found fit, to the 2nd grade of Assistant Engineers on a salary of R350 per mensem, after two years of apprenticeship. Government, however, ruled that only one such appointment should be given to the best student of the College every year. (*Vide* para. 2 of G. O. No. 1237, dated 14th May 1872.) Accordingly Mr. Rathnasabapathy Pillay was appointed in the year 1874. In subsequent years the ruling was interpreted as not binding on Government; and up to the year 1885 no Native was appointed to this branch, save that of Mr. Gopalakrishna Iyer in 1880, which, as a special case, was sanctioned by His Grace the Duke of Buckingham. Since 1885, however, one Native has been appointed every year to this branch. What is wanted, in my opinion, is that no less than three such appointments should be given to Natives every year, as recommended by the Committee above referred to; and that the ruling of Government on this subject should be plain and definite, and not liable to different interpretations.

Upper Subordinate Branch.—The following table gives the number of European and Native subordinates employed at present in the different grades of this branch. It will be seen that an unduly large number of Europeans are employed in the higher grades :—

		Salary.	Natives or Civilians.	Europeans.	Total sanctioned strength.
Overseer,	3rd grade .	60	25	...	92
Do.,	2nd do. .	80	28	...	
Do.,	1st do. .	100	23	16	
Supervisor,	2nd do. .	150	28	8	36
Do.,	1st do. .	200	11	11	22
Sub-Engineer,	3rd do. .	250	12	5	17
Do.,	2nd do. .	300	5	4	9
Do.,	1st do. .	400	2	7	9

Previous to the year 1880, passed students of the Civil Engineering College, of whatever nationality, joined this branch in the third grade of Overseers; and according to merit and seniority, each got up to the first grade of Sub-Engineer in his own turn. But since that year a system of recruiting this branch has been followed, by which great injustice is being done to the Native subordinates, the system being that of European military students of the Civil Engineering College being, after one year's course of apprenticeship, brought on the permanent establishment as first grade Overseers. In the year 1884 I complained to His Excellency the Governor in Council, and hereunto is attached a printed copy of my memorial A on the subject.

The Madras Government acknowledged the injustice complained of by me; and in G. O. No. 1291, dated 23rd May 1884, they said that by this system "the promotion of second and third grade Overseers is most injuriously retarded." They further sanctioned, in view to allowing a flow of promotion to the second and third grade Overseers, an arrangement by which the proportionate scale of first grade Overseers was increased annually by the number of military men brought on the establishment, and that of third grade Overseers proportionately reduced. This

The *President*—contd.

arrangement afforded only partial relief to Overseers of second and third grades, for although it gave them increase of salary, still they were as far as ever from the rank of Supervisor.

Accordingly I complained again to the Chief Engineer, Public Works Department, in December 1885 (*vide* accompanying printed copy of my memorial B). In this I showed how extremely difficult it was for a Native Overseer to rise up to the rank of Supervisor, my own case being taken as a typical one. My service in the Department is now about ten years, and my present position is 20 places from the bottom of first grade Overseers or (20+39=) 59 places from the bottom of second grade Supervisor. But bearing in mind that vacancies in the first grade of Overseers are being filled up by the annual direct appointments of military men, it will be seen what little prospect there is for Native subordinates rising up to the grade of Supervisor.

The case is rendered still worse by the fact that Government have directed the appointment of a larger number of military men to the first grade of Overseers than there may be vacancies for. For in G. O. No. 2317, dated 6th October 1880, they have laid down that six military men may be appointed every year, and have further said regarding them that "these Apprentice Overseers will, during their year of probation, be outside the Public Works establishment. At the close of the year they will be brought on to the permanent strength of the Department, as supernumeraries, provided no vacancies exist for them to fill. The Chief Engineer will take the earliest opportunity of absorbing such supernumeraries." The effect of this ruling is acknowledged by Government in the following words (*vide* G. O. No. 1291, dated 23rd May 1884) : "At present, however, the establishment is in excess of scale; and as the period within which the supernumeraries can be absorbed will be prolonged by the annual appointments of soldier-apprentices, the promotion of second and third grade Overseers is most injuriously retarded."

But another and still more serious effect of this ruling will be, in the words of J. P. Davidson, Esq., now Under-Secretary to Government, Irrigation Branch, "the disappearance (within a few years) from the Department not only of the second and third grade Overseers, but also of Native subordinates," who form "a most useful and necessary part of the executive machine of the Department."

The Madras Government fully recognised this injustice, and made a proposal to the Government of India for their sanction, which was almost on the lines laid down by me in my memorial B. (*Vide* Chief Engineer's note No. 1902, dated 21st May 1886.) But the Government of India not having approved of that proposal, the matter had been allowed almost to drop, with the two-fold result of myself and other Native subordinates finding ourselves, with the lapse of every year, further and further from the rank of Supervisor and the scope of fresh appointments to the Native students of the College becoming more and more curtailed.

The military men are, after all, not such a necessity in the interest of Public Works. The Native subordinates are as good as these men, and their character is certainly not worse.

The *President*—contd.

9. My proposal is as follows:—

(1) No more than two military men every year should be appointed to the upper subordinate branch of the Department, and these should begin as third grade Overseers, but with a higher rate of pay than Natives.

(2) The remaining vacancies on the third grade of Overseers should be filled by A.C.Es. or B.C.Es. of the College. This is in view to improving the moral tone of this branch of the Department, which, from the material with which it is being recruited, has not been as high as is desirable. Men of such superior qualifications are now available in abundance; and considering the trust and responsibilities of an Overseer's office, none but a highly educated man should be appointed to it. This proposal has also the effect of opening a fairly good scope of respectable employment for A.C.Es. and B.C.Es.

(3) Vacancies in the higher grades should be filled by promoting men from the next lower grades.

(4) The Native students of the College who pass out as Overseers should be appointed mainly as draftsmen in the Divisional Offices, but in a few instances as Sub-Overseers in the lower subordinate branch. The present class of draftsmen know nothing about levels or designs of any irrigation works, and are a standing-block to the progress of professional work in a divisional office. The most distinguished student of the Overseer's class, however, may be appointed to the third grade of Overseers, as the most distinguished A.C.E. or B.C.E. is at present appointed to the Engineering Branch.

(5) The special department of the College passing out Surveyors and Draftsmen may be abolished.

Transfer of Subordinates.—An Overseer is sometimes transferred to distant stations. For instance, I am now on my way from North Arcot to Ganjam. I am aware that this is done in the interest of Government, and personally I do not complain, and have not complained, in the sense of a prejudice or unwillingness to go to distant places. But I do consider it a hardship that my pay being only ₹80 per mensem, I should be compelled to to go to a place from which, if I should once take leave to visit my native place, I should have to spend about ₹300 for my voyage to and back. Like Tahsildars and Sub-Magistrates, who are never transferred out of a district except as punishment or for some special reason, Overseers and other officers drawing small salaries should not, I think, be transferred out of a circle. Supervisors and Sub-Engineers may, however, have such transfers.

Temporary Establishment.—Appointments to this establishment are made in some cases indiscriminately and without reference to proved

The *President*—contd.

character and merit. The sanctioned scale of the manent establishment being small compared to the works that have to be executed, a large number of men are employed on various grades, and are put in charge of very important and responsible works. These, being men who have no permanent footing in the Department, and who have nothing to fear in case they are found to be doing bad work or guilty of irregular conduct, should not, in my opinion, be entrusted with the execution of works; for, if a work carried out by such a subordinate be found, after a lapse of some years, to be of bad construction, and consequently to have failed, he cannot be brought to punishment, for he may have left the Department by that time. These temporary men may, however, be employed on the preliminary works of a project, such as taking surveys, levels, preparing plans, &c., because, in doing such works, there is little inducement to go wrong. I have been led to express this opinion from my own observation and in the interest of Public Works.

Superior Accounts Branch.—There are seven appointments for this Presidency in this branch, of which there is not a single one held by a Native. All these are held by Europeans, though among the inferior Native Accountants there are some who are qualified for these superior posts. In my opinion, a system must be adopted by which the most qualified men, be they Europeans or Natives, may be eligible for them, irrespective of their nationality or religion.

Can you ride?—Yes; I was a very good rider at one time. For some years I did all my marches on horseback.

Have any complaints been made of any want of activity on your part, or of your being unable to stand the heat of the sun?—No. It was only recently that I got a testimonial from my superior in which he spoke in high terms of my intelligence, honesty in my work, and of my character for uprightness and painstaking.

Have you ever had charge of a subdivision?—No, but I have occasionally had to supervise an area as large as a subdivision.

What sort of works have you had charge of?—I had charge of tank irrigation in North Arcot, and also of a little bit of channel irrigation; and during the two years I was in Tanjore I was employed entirely on channel irrigation. In that district I had once to construct a regulator course for two rivers from Captain Brockman's design. I was selected by the Engineer as the fittest man to carry out the undertaking, and my work was pronounced satisfactory by the Superintending Engineer. The cost of the regulator was ₹45,000.

Mr. *Ramaswami Mudaliyar.*

Do you know of any Overseer of two or three years' standing who cannot ride a pony?—No.

An Overseer by the nature of his work has to expose himself constantly?—If he does his work honestly he is exposed to the sun or rain for the greater part of the day,—from eight to four in fact.

Most of the Overseers are Hindus and Mahomedans?—Yes, and some of them are Eurasians.

India.

P. W. Department.

Section III.

Subramanya Sastri, Esq.

The *President*.

Have you any further observations to make?—I wish to say that Native upper subordinates have plenty to do in the way of designing.

What sort of things?—Tanks, weirs, sluices, head sluices to channels, aqueducts,—in fact everything connected with tank irrigation; and this has been acknowledged by the Chief Engineer, Colonel Mullins, in a circular, although at the same time he ordered that in future such works should be done by the Engineers.

Witness handed in the following:—

Extracts from professional circular by Colonel John Mullins, R.E., *Chief Engineer for Irrigation,—No. 37, dated 5th July 1876.*

The replies which have been received to memorandum No. 4 C. of 1876, indicate that, with some few exceptions, District and Executive Engineers have been in the habit of leaving the designing of masonry works far too much to subordinates.

The *President*—contd.

* * * * * * * *

* * The undersigned gladly recognises the fact that much excellent designing has been done by members of upper subordinate grades, while in some instances a marked capacity for designing has been evinced by them. The responsibility for the suitability of a design rests nevertheless with the District Engineer, and it is his duty to see that all requisite data are obtained and that the design conforms to the circumstances thus evidenced.

Witness No. LIX.—*5th August 1887.*

Rai Bahadur Subharaya Chariyar.

Examination of Rai Bahadur Subharaya Chariyar, B.C.E., Executive Engineer, third grade, sub. *pro tem.*

The *President*.

When did you enter the Department?—In 1865. I was the first B.C.E. ever created.

How long after you took your degree were you appointed Assistant Engineer?—After six years' probation, because they said I lacked experience and would do better to enter the Department in the subordinate grade, and an order was passed to that effect, though the rule was not observed in the case of Europeans.

Were reports annually made as to your fitness?—They must have been, but we never see those things.

When Europeans were appointed above you, you complained?—I made a personal complaint to the Chief, who promised to make me an Assistant Engineer speedily.

Did he tell you that you had not yet got to the stage at which he thought you could be employed with advantage?—He told me I should do better in the subordinate grade until I gained experience, but that reasoning does not appear to have been applied to the Europeans who came from the same College.

Did you pay any fees for instruction in the College?—Yes; I paid R10 a month—the highest college fee in all India; and the Europeans I speak of paid no more. They never took the B.C.E.

Mr. *White*.

Was it ever complained of you that being a B.C.E. you were above your work as Overseer?—No; I was well spoken of all along.

The *President*.

On what ground were those gentlemen preferred to you?—I do not know.

You complain that you have been superseded by fifteen officers since you became Engineer?—Yes.

Have you anything further to say?—No.

The *President*—contd.

Have you had any Cooper's Hill Assistant Engineers under you?—Yes, temporarily.

How did they work?—They appeared to me to be rather inexperienced.

They were young men?—Yes, and have been in the country only four or five years. My opinion was that they were put in charge of subdivisions too early.

Were they acquainted with the language?—Some of them were not. I only saw them on three occasions in three months.

Have you had B.C.Es. under you?—Yes, as Overseers.

Any European or Eurasian Assistants?—Not regular Assistants. They were at one time called temporary Assistant Engineers. One was a European and military man; he did his work very well.

Any Native temporary Assistant Engineer?—No.

Mr. *White*.

I believe you did some work for the Madras Municipality?—Yes.

Was the quality of that work certified to in any way?—I have told you that I was always spoken of well.

For an Engineer to do his work efficiently, is it necessary that he should have a good command of the vernacular languages?—It is essential, otherwise we should require interpreters.

Who would be likely to mislead you?—Yes.

Your workmen would have no means of making known their grievances?—Yes.

Sometimes it would give rise to a good deal of mischief?—Yes.

How long does it take a young Engineer to qualify to an extent that really repays the State

Mr. *White*—contd.

the money he draws from it?—Two years if he has varied opportunities.

Are the Cooper's Hill College men good vernacular scholars?—I have never met any who were.

Mr. *Ramaswami Mudaliyar.*

Do you know any Hindu or Mahomedan Overseers of two or three years' standing who cannot ride?—No man could be an Overseer unless he knew how to ride.

Mr. *Ramaswami Mudaliyar*—contd.

Do you ride yourself?—Yes.

Mr. *White.*

Is there not a departmental examination which Engineers have to pass?—Yes.

Are all Engineers bound to pass it?—It is compulsory now. At one time they were not so particular.

WITNESS No. LX.—*5th August 1887.*

Examination of RAI SAHIB RATNASABHAPATI PILLAI, B.A., B.C.E., Assistant Engineer, 1st grade.

Rai Sahib Ratnasabhapati Pillai.

The *President.*

When did you become B.C.E.?—In 1874, and got an appointment in this Department the same year. I have served in North and South Arcot Tanjore, and Salem mostly on irrigation,—that is, to say, embankment and channel construction.

Have you felt any difficulty in discharging your duties as Assistant Engineer?—No.

Have you been complained of as wanting in subordination?—No.

Or as having shirked exposure to the heat?—No.

Can you ride?—Yes.

What is the largest work on which you have been employed?—I was mostly placed in unimportant subdivisions. I was on one occasion transferred from Tanjore to North Arcot to take charge of the Vellore Bridge until a European arrived and I was transferred.

Why were you always sent to unimportant subdivisions?—I cannot say. I was once in charge of B project division; that was design work.

You had to prepare designs and estimates?—Yes.

Did you make the designs?—Yes.

The *President*—contd.

How long were you employed on that?—About six months, and then the permanent officer came back and I was relieved.

Have you had any Cooper's Hill men working under you?—One; he was a Eurasian.

What did you think of his professional knowledge?—He was only under me for about a fortnight, so that I cannot form an opinion.

Have you any observations to make regarding the constitution of the Department?—Yes. The treatment of Europeans and Natives is not always equal. I was superseded on several occasions. On one, owing to the fact that three months' grace was given to certain persons to pass the vernacular examination. There is a Government order to that effect. If it had not been that this grace was given I should have got beyond those persons.

Mr. *Ramaswami Mudaliyar.*

How many persons have superseded you since you became 2nd grade Assistant Engineer in 1881?—Eleven; one was a Native.

I understand these were temporary appointments. Has anybody superseded you permanently?—No.

WITNESS No. LXI.—*5th August 1887.*

Examination of J. R. UPSHON, ESQ., Establishment Clerk, Public Works Department Secretariat.

J. R. Upshon, Esq.

The *President.*

When did you enter the Public Works Department?—In 1875 as an indexer. I was born and educated in India of parents domiciled here.

Have you any observations to make in reference to the present enquiry?—Yes (*reads*).

With the exception of the one guaranteed appointment, the Engineer establishment in this Presidency is entirely closed to "Natives of India."

So far back as 1871 the evil results of such a monopoly were noticed and a Committee formed to propose some remedial measures.

The report of this Committee was disposed of in G. O. Nos. 2607 of 13th October 1871 and 1237 of 11th May 1872.

The *President*—contd.

In their report the Committee remark: "Notwithstanding the views expressed by several professional officers, we are satisfied that it is expedient to hold out to the Natives of the country better prospects of promotion in the Department than have as yet been open to them. We would remark that Natives have shown themselves well qualified for the performance of all the ordinary duties of the Public Works Department; that they have within recent years successfully filled many offices of trust; and that, in many respects, they have strong claims to suitable employment, and have many advantages in ascertaining correctly the wants of the villagers, and in being able to explain to them to what extent these can be

India.

P. W. Department.

Section III.

J. R. Upshon, Esq.

The *President*—contd.

provided for by the Government under the rules in force. We think that a serious mistake has been made in the administration of the Department in not fostering and encouraging Native talent and enterprise in a profession for which the old hydraulic works of the country show that the Native of this Presidency possesses a remarkable degree of natural aptitude."

The Committee recommended "that three appointments might be annually given to those students of the Civil Engeering College who, having passed a satisfactory examination at that institution, have attained the most distinguished positions in the list of B.C.Es. at the Madras University. That the appointment shall be those of 2nd class Probationary Assistant Engineers, on a salary of ₹150 per mensem with travelling allowance of ₹3 per diem."

The Madras Government in their order No. 1237 of 14th May 1872, on the report of the Committee stated as follows:—

"The Government are of opinion that, under the regulations drawn up by the Committee, *one* appointment to the grade of Probationary Assistant Engineer may be made of Natives and East Indians who have duly qualified at the Civil Engineering College and University. More they do not think the limited establishment of the Public Works Department will enable them to provide for, seeing that provision has to be made in this Presidency for employment of one full battalion of Royal Engineers, and that a proportion of the students of the Cooper's Hill College will likewise have to be provided for."

The "limited establishment of the Public Works Department" contained at that time 100 Engineers, of whom 47 were Royal Engineers, 9 staff Corps officers, 4 warrant officers, 39 Europeans, and one Native. The one Native was appointed to the Engineer establishment in August 1871 on the passing of G. O. No. 2160, 22nd August 1871, appointing the Committee.

Before the year 1872 the following gentlemen passed out of the Civil Engineering College as Assistant Civil Engineers.

December 1863.

A. Rama Ran; S. Subraya Chariyar; C. Colundavaloo Mudaliyar.; Lieutenant C. C. Sexton, R.A.; P. Moongasem Mudaliyar.; G. Ratnam Mudaliyar.

May 1864.

St. John H. Buchan.

January 1865.

O. V. Norris; A. Grant.

May 1865.

Lieut. R. F. Taylor.

May 1866.

C. D. Potter; N. Veeranagavalu Aiyar; R. Hunter.

May 1867.

J. F. Gorman; G. H. Rogers.

October 1867.

Lieut. F. W. Graham.

The *President*—contd.

December 1868.

Captain G. P. Worster; J. T. Simpson; R. Warden; J. A. Price; S. A. Mobadova Aiyar; A. McD. Salmon.

December 1869.

C. Chumatambi Pillai; E. G. Lynn; C. H. T. Norfor.

May 1870.

A. W. Hunter; H. Arbuthnot.

December 1870.

C. R. Soobrayen, B.A.

May 1871.

Lieutenant F. Greenaway.

December 1871.

J. P. Arbuthnot.

1872.

No students in the Civil Engineering College.

Of the above 30 passed A.C.Es., the following obtained situations in the Department:—

S. Subbarayachariyar (passed December 1863):
Overseer, May 1865.
Supervisor, May 1866.
Assistant Engineer, 2nd grade, August 1871.

*Lieutenant R. F. Taylor (passed May 1865):
Assistant Engineer, 2nd grade, December 1865.

G. Ratnam Mudaliyar (passed December 1863):
Overseer, March 1867.
Resigned.

A. Rama Rao (passed December 1863):
Overseer, May 1867.
Resigned.

*J. F. Gorman (passed May 1867):
Acting Assistant Engineer, June 1867.
Assistant Engineer, 2nd grade, January 1868.

*A. W. Hunter (passed May 1870):
Assistant Engineer, 3rd grade, August 1870.

*C. H. T. Norfor (passed December 1869):
Assistant Engineer, 3rd grade, August 1870.

N. Veeranagava Aiyar (passed December 1869):
Overseer, February 1871.

Lieutenant Greenaway (passed May 1871):
Assistant Engineer, 2nd August 1872.

C. Chinnatambi Pillai (passed December 1869):
Overseer, June 1871.

S. A. Mahadeva Aiyar (passed December 1868):
Overseer, 3rd April 1872.

H. Arbuthnot (passed May 1870):
Overseer, 2nd September 1873.

E. R. Subraya Aiyar, B.A., B.C.E. (passed December 1870):
Overseer, 2nd January 1874.

* Europeans.

The *President*—contd.

It will be thus seen that only the five European passed students were appointed to the Department as Assistant Engineers, while the Natives and Eurasians who passed earlier and better received only Overseer's posts, the lowest in the Department. During the same period (1863 to 1872) 78 Europeans were appointed to the Department as Engineers.

The discouragement shown to Natives led many of them to seek employment under other Governments or to enter other walks of life, *e.g.*—

J. T. Simpson, B.C.E., Engineer, 2nd grade, Bengal.

J. A. Price, A.C.E., Executive Engineer, 3rd grade, Bengal.

A. Grant, B.C.E., Deputy Examiner, Railway Accounts, Bengal.

R. Warden, A.C.E., Executive Engineer, 4th grade, Bengal (deceased).

E. G. Lyon, B.C.E., Executive Engineer, 3rd grade, Hyderabad.

C. R. Subraya Aiyar, B.C.E., Assistant Engineer, Mysore.

O. V. Norris, Assistant Engineer, Mysore.

St. John Buchan, A.C.E., Assistant Engineer, Mysore.

C. Colondavalu Mudaliyar, B.C.E., Assistant Engineer, Travancore.

A. Rama Ran, B.C.E., Supervisor, Malabar Local Fund Department.

The Principal of the Civil Engineering College, in reporting to the Madras Government on the fitness of Mr. J. T. Simpson for appointment as an Apprentice Engineer in Bengal, remarked,—

"I have no hesitation in saying that he is quite competent to fill the post of Apprentice Engineer that the Government of India are willing to offer him, and while recommending him for this appointment, I beg to express my regret that no suitable employment could be found for him in the Madras Public Works Department."

In the early part of 1873 the Secretary of State desired "to be informed of the exact progress made in the Engineering Colleges established in the different Presidencies towards furnishing a supply of trained Engineers fitted to undertake the subordinate duties of Engineers, and what number of young men, Native or otherwise, have hitherto obtained employment in your service as Assistant Engineers."

The Principal of the Civil Engineering College in his report states that

"the smallness of the number of students who have passed out of the College during the last five years is owing to the difficulty experienced by the students who had gained certificates of qualification as Assistant Engineers obtaining employment under the Government in that grade—a difficulty so great that two Natives were compelled by their circumstances to enter the Department Public Works in the subordinate grade of Overseer."

The Director of Public Instruction, in submitting the Principal's report, remarked: "The chief work of the Civil Engineering College lies in educating Overseers; but this arises from the fact that most scanty encouragement has been given to the senior department of the College."

The *President*—contd.

From 1873 to 1878 the following students passed the A.C.E. Examination:—

December 1873.

N. Rathnasabapathy Pillai, B.A.; J. E. Laful-nais; W. A. Mathews; Kaliyanarama Aiyar.

August 1874.

W. McHutchin.

1875.

Nil.

January 1876.

T. Ragnavacharay, B.A.; C. Mahadava Sastri, B.A.; C. R. Chinnaswamy Aiyangar; E. A. French.

December 1876.

K. Vythianatha Aiyar; S. Kistnamacharry; C. Authicasovooloo; K. Kurwila.

December 1877.

S. Venkataramana Aiyar; K. C. Nivan.

December 1878.

H. O'Flaherty; V. Nithiananda Mudaliyar; S. Soundaraja Aiyangar.

Of the above only N. Rathnasabapathy Pillai, B.A., B.C.E., the first of the passed students of 1873, was appointed a second-class probationary Assistant Engineer on a salary of ₹150 per mensem, and was confirmed as Assistant Engineer, 3rd grade (₹250), in March 1876 (G. O. No. 1435 of 9th June 1876).

T. T. Roghava Charry, B.A., B.C.E., the first of the passed students of 1876, was strongly recommended for Assistant Engineership guaranteed in G. O. No. 1237 of 14th May 1872, but the Madras Government, in their order No. 1075 of 29th April 1876, repudiated the idea that the Government had guaranteed such an appointment to the first passed student of the College, though in the G. O. (No. 909 of 1st April 1874) appointing N. Rathnasabapathy as Assistant Engineer they tacitly admitted it.

This order created quite a sensation in the Educational Department and elicited from the Director of Public Instruction a strong letter of protest. In asking for a reconsideration of the order, the Director remarked:—

"The unsatisfactory position of the College Department of the Civil Engineering College, owing to the small prospects of employment which the students had before them, was prominently brought to the notice of Lord Napier at one of the Anniversaries of the College by Mr. Powell (the then Director of Public Instruction), and the result was the appointment of a committee who recommended that three appointments as Probationary Assistant Engineers should be annually given to those students who might attain the most distinguished positions in the list of Bachelors of Civil Engineering."

Government, in paragraph 2 of their order No. 1237 of the 14th May 1872, approved of the regulations drawn up by the committee, but determined that only one appointment should be made annually instead of three.

The *President*—contd.

This was understood to be a distinct pledge that one appointment would be given annually in the manner recommended by the committee. It was referred to as such in the Public Instruction Report of the year and at various anniversaries which have been held since, and there is very little doubt that the offer of this valuable prize has largely contributed to the marked improvement which has taken place in the number and qualifications of the students now entering the senior department of the College.

It so happens that the young man who had reason to accept this appointment this year is the most distinguished student who has ever passed out of the College, and I have no doubt that he entered the College and worked his way through the course in the full assurance that if he succeeded in fulfilling the conditions named, the reward promised would be given. To a person so situated, the withholding of the prize can scarcely appear in any other light than that of a breach of faith.

The Government, in their order (No. 1354 of 31st May 1876) disposing of the letter of the Director of Public Instruction, reiterate that the guarantee was not an absolute one, but that "T. Raghava Chariyar will be appointed as a Probationary Assistant Engineer on the occurrence of the first vacancy."

This promise has up to date never been fulfilled, though thirty-seven European and Native Engineers have since been appointed to the Department.

The failure to appoint Raghava Chariyar as a permanent Assistant Engineer cannot be on account of any unfitness on his part, as he did good service from 1885 to 1887 as a temporary Engineer.

T. Raghava Chariyar is now a Sub-Engineer, 3rd grade, on ₹250 per mensem, while four of his juniors (the first passed men of 1879, 1884, 1885, 1886) are Assistant Engineers.

Eleven of the other passed men of 1873-1878 were appointed Overseers, &c. :—

J. E. Lafrenois, Overseer grade, 1874.
W. A. Mathews, do. do., 1874.
Kalyanarama Aiyar, do. do., 1874.
T. Raghava Chariyar, B.A., Supervisor, 2nd grade, in 1876.
C. Mahadava Sastri, B.A., Overseer grade, in 1876.
C. R. Chinnaswamy Aiyangar, Overseer grade, in 1877.
E. A. French, Overseer, 2nd grade, in 1877.
R. Vythianatha Aiyar, Supervisor, 2nd grade, in 1879.
S. Kistnamacharry, Overseer, 2nd grade, in 1878.
C. Authicasavooloo, Overseer, 3rd grade, in 1878.
K. C. Nivan, Overseer, 3rd grade, in 1878.
V. Nithianada Mudaliyar, Apprentice Supervisor, 2nd grade, in 1881.

Mahadava Sastri, Authicasavooloo, and K. C. Nivan resigned the Department in disgust; the first took up an appointment as Engineer under the Mysore Government, the second took up an appointment as clerk in the Revenue Department (and is now Tahsildar of Anantapur), and the third as Engineer under the Travancore Government.

The *President*—contd.

From 1879 to 1884 the following students passed the A.C.E. examination :—

December 1879.

Gopalakrishna Aiyar; T. Subramania Aiyar; A. Nilakanta Sastri; N. Rajagopala Aiyangar; S. Sesha Aiyangar.

December 1880.

S. X. Saldanha; Mir Sadr-uddin.

December 1881.

Hormusji Nowroji.

December 1882.

Nil.

December 1883.

K. Krishnan Nayar, B.A.; S. A. Vaikuntam Aiyar B.A.; R. V. Narayaná Aiyar; A. G. Umomen; A. R. Natesan, B.A.; T. Bhavana Sankava Sastri.

December 1884.

S. A. Subramanya Aiyar, B.A.; K. R. Rungaswami Aiyangar; S. A. Swaminatha Aiyar, B.A.; V. R. Rungaswami Aiyar; T. S. Sesha Aiyangar; J. E. A. D'Cruz; A. C. C. McLeish; M. Rama Krishna Aiyar; P. V. Raghava Chari; P. G. Vencatasabba Aiyar; S. G. Krishnaswamy Aiyar.

Of the above, the following obtained appointments :—

Gopalakrishna Aiyar, Assistant Engineer, 3rd grade.
T. Subramanya Aiyar, Apprentice Supervisor, 2nd grade.
A. Nilakanta Sastri, Apprentice Supervisor, 2nd grade.
N. Kajagopala Aiyangar, Apprentice Supervisor, 2nd grade.
S. X. Saldanha, Apprentice Supervisor, 2nd grade.
Hormusji Nowroji, Assistant Engineer in the Madras Municipality.
S. A. Subrahmanya Aiyar, B. A., Assistant Engineer, 3rd grade.

The Government of India, in their Resolution No. 241-51 G., dated 14th February 1882, guaranteed one appointment as Assistant Engineer to the first-passed student of 1885 and 1886, and in a subsequent Resolution No. 1443-G., dated 18th December 1884, they made the guarantee an annual one.

The immediate effect of these Resolutions was the increase of the number of students in the senior Department of the Civil Engineering College and the increase of the annual number of passed students.

In 1885 and 1886 the following students passed the A.C.E. Examination :—

December 1885.

1. R. A. Srinivasa Aiyangar, B.A.
2. V. Aiyaswami Aiyar, B.A.
3. R. V. Subrahmanya Aiyar.
4. G. V. Subrahmanya Aiyar.
5. M. A. Anantalwar, B.A.
6. D. V. Jaganatha Chari.
7. C. Mahadava Rau.
8. F. Ramaswami Aiyangar.

The *President*—contd.

December 1886.

1. R. Gopala Aiyar, B.A.
2. R. V. Sundaram Aiyar, B.A.
3. A. V. Panchapakesu Aiyar, B.A.
4. S. Lakshminarayana Aiyar.
5. D. Seshachella, B.A.
6. N. Pravatantibava Aiyar.
7. V. K. Narayana Ungthan.

Of the above the first students of 1885 and 1886 have been provided with Assistant Engineership, 3rd grade, but the others have had to go without any employment.

From the year 1863 to 1886, 78 Natives of India have qualified for the Assistant Engineer grade; and of these only 6 have been given appointments as Assistant Engineers. In the same period 144 Europeans (Royal Engineers and Staff Corps Officers, covenanted and uncovenanted officers) have been appointed to the Engineer Establishment of the Madras Public Works Department to the nearly entire exclusion of the children of the soil.

The creation of the Royal Indian Engineering College at Cooper's Hill in 1871 was never intended, as the following extracts will show, to shut out Natives of India from the Engineering establishment:—

"One thing seems clear. Adequate provision should be made for admitting qualified Natives of India to this branch of the public service, and it will be satisfactory to know that this important point has been fully provided for."—Paragraph 18 of further papers relating to the Indian Civil Engineering College, 1871.

"It may be said that Natives will be practically excluded from competing. But it has been already explained that the Indian Colleges afford abundant facilities for the admission of Natives to this branch of the service, since they offer gratuitous education, with stipends attached, and that the whole number of scholarships thus available to Indian youths is not made use of."—Paragraph 26 of further papers relating to the Indian Civil Engineering College, 1871.

In the revised prospectus of Cooper's Hill College for 1871, under the heading "Particulars regarding the Indian Public Works Department," there is the following:—

31. The Department is supplied from the following sources:—

(1) Officers of Royal Engineers.
(2) Other officers of the Indian Army who have passed the qualifying examination.
(3) Passed students of Government Civil Engineering Colleges in England and India.
(4) Civil Engineers in practice of approved qualifications appointed direct by the Secretary of State or Government of India.
(5) Deserving subordinates promoted.

At present, class (5) are altogether shut out, and class (3), so far as Indian passed students are concerned, are admitted to the number of nine annually.

To get the scheme of establishing a College in England sanctioned, it was stated that it would in no way deprive educated Natives of India from entering the Indian Engineering Establishment, but once the College was sanctioned, the rights of Natives of India were gradually eliminated.

Cooper's Hill College was established in 1871, because the Indian Engineering Colleges did not pass out a sufficient number of young men to suit Government requirements, and should therefore now be closed as the Indian Colleges can supply in full the Government demands.

The cruelty of making India pay for the upkeep of a College which deprives its own children of employment is so self-evident that no comment of mine is needed.

Six upper subordinates who had passed the A.C.E. examination served as temporary Engineers from 1883 to 1887 and did very good service.

It is true that from 1885 one appointment as Assistant Engineer, 3rd grade, is guaranteed to the first-passed student of the local College of Engineering, but this has only increased the heart-burning of the sixteen passed A.C.Es. and B.C.Es., who after years of good service in the upper subordinate grades are superseded by young inexperienced men. The concession also seems to have been made more with a view to bolster up the Indian Colleges of Engineering than to help Natives of India.

That the natives of Madras have been unjustly treated I beg a reference to the classified lists of the Engineer Establishment under the Governments of India and Bombay. In the Madras Engineer Establishment there are six Natives of India, in the Government of India Establishment seventy-three, and in the Bombay eighteen (exclusive of Eurasians). Of the Madras Native Engineers, all six have passed the B.C.E. examination, while of the seventy-three of the Government of India men only three have passed the B.C.E. examination.

So far I have only dwelt on the wrongs of Natives of India who had passed the higher examinations in Engineering, but there is another class whose claims cannot be silenced on the plea of "no experience," and that is, the class of deserving upper subordinates who arriving at the top of the Sub-Engineer, 1st grade, find that all their experience and good work cannot obtain them ingress into the Engineer Establishment. Before 1872 many a European upper subordinate was promoted to the Engineer Establishment, but even then there is no record of a single Native of India having been so rewarded, though many of them were recommended for the step by experienced officers of the Department.

A late and striking instance of this exclusion of Natives of India from the Engineer Establishment is the case of Messrs. Ottman and Ellis.

These gentlemen had been at the head of the Sub-Engineers, 1st grade, for many years, and during that time had won golden opinions from every officer that they had served. The Madras Government in 1883, on the pressing recommendation of the Chief Engineer for Irrigation, solicited sanction of the Government of India to the employment of these gentlemen as Executive Engineers in reward for their long and good service.

India.

P. W. Department.

Section III.

J. R. Upshon, Esq.

The *President*—contd.

The Government of India declined to sanction their appointment on the ground that the Secretary of State had prohibited the appointment of any but "pure Asiatics to the Engineer grades."

This question was taken up by all the European and Eurasian Associations in this country and the prohibition was in 1884 removed. Yet Messrs Ottman and Ellis are still Sub-Engineers, 1st grade, and raw youths from Cooper's Hill College are yearly appointed to the Department. Mr. Ellis in disgust has taken up the Local Fund Engineership in Salem on a salary of ₹500 with travelling allowance at ₹5 per diem.

Though these upper subordinates are not fitted to enter the permanent Engineer Establishment, yet the Government of India, in their Resolution No. 1146 G. of 23rd August 1883, considers that they "are fitted by the Engineering experience they possess to conduct the duties required of temporary Engineers."

Under this resolution, thirteen upper subordinates from the Superviser and Sub-Engineer grades were from 1883-87 appointed as temporary Engineers on salaries ranging from from ₹350 to ₹450, and every one of these men gave complete satisfaction in the discharge of their duties.

The upper subordinates in the Sub-Engineer grades are in charge of some of the most important subdivisions and have always borne the best of characters.

During the time of the great famine of 1876 these Upper Subordinates did splendid service under the most trying circumstances.

The Buckingham Canal, the largest work of the famine, was under the superintendence of Mr. J. O'Shaughnessy, District Engineer, who himself was a promoted upper subordinate; and of the three divisions of the canal, one was till its completion in charge of a Eurasian Supervisor (Mr. J. Stephens), and another was for some time in the charge of another Eurasian Supervisor (Mr. B. Stephens).

Mr. K. Nordman, who did the tracing and construction of the roads on the Burghur and Potinghi Ghâts is another example of a good Executive Engineer promoted from the upper subordinate grades.

The only objection that has ever been urged against the promotion of upper subordinates to the Engineer Establishment, is that they have not the necessary "social status," but surely in this nineteenth century and in India such a reason is worse than no reason at all.

If these very men can command respect as honorary and temporary Engineers, it is surely possible that they will do so when appointed permanent Engineers.

The following senior upper subordinates in the Public Works Department, despairing of further promotion, have taken service as Engineers under Municipalities and Local Fund Boards:—

B. Stephens, Coimbatore.
W. Donaghue, Chingleput.
E. Holdwell, Ooty.
J. Ellis, Salem.
C. Seton, Vizagapatam.

The *President*—contd.

Native Engineers in the Public Works Department.

	Executive Engineer, 1st grade.	Executive Engineer, 2nd grade.	Executive Engineer, 3rd grade.	Executive Engineer, 4th grade.	Assistant Engineer, 1st grade.	Assistant Engineer, 2nd grade.	Assistant Engineer, 3rd grade.	Apprentice Engineer.	Temporary Engineers.	Total.
Railway works, .	...	...	1	4	3	3	1	2	2	16
Bengal . .	...	4	1	7	5	1	...	...	...	18
North-Western Provinces and Oudh . .	...	...	1	2	8	...	...	1	...	12
Punjab . .	...	...	1	3	5	4	...	...	...	13
Local Administration . .	1	1	2	...	5	3	2	...	...	14
Bombay . .	...	...	3	3	10	...	1	1	...	18
Madras . .	...	...	...	1	2	2	1	...	...	6

No domiciled Europeans or Eurasians are included in this list.

On a perusal of the rules for appointment to, and examination for, the superior Accounts Establishment, it will be seen that candidates have to be nominated by the Accountant-General, Public Works Department. This nomination is considered a bar to the majority of outsiders who wish to enter the Department, and it will apparently require special and local influence with the Accountant-General to secure a nomination. The appointments should be thrown open to competitive examination and the best of the successful candidates appointed. The probationary service, until the departmental test is passed, will show whether they are fit for the Department or not.

The age for examination might with advantage be extended to 25 years.

It is not clear why Hindustani should be obligatory. A native language, if necessary, should be optional.

Latin or French or German would be almost prohibitive to a native.

There perhaps was a time when, owing to the difficulty in obtaining qualified men, it might have been necessary to appoint Royal Engineers, covenanted Engineers, &c., to the Accounts Branch, but that necessity no longer exists. Qualified men can now be easily obtained, and the appointments should be given to those who have a right to them, —*viz.*, the Natives of India.

Some stress has been laid in the evidence lately given, that a knowledge of Engineering is useful to an Accounts officer. This, if carefully looked into, will be proved to be materially imaginary. An acquaintance with the terminology used in the estimates and classification of Engineering works might be useful in a very slight degree, but it is not at all necessary to an Accounts officer. This knowledge is easily acquired by any one, and it is not necessary on this account to recruit the Accounts Establishment from among the Royal Engineers, Stanley Engineers, or Cooper's Hill men.

While the rules admit of the transfer of Accountants to the superior Accounts Establishment, they at the same time lay down that these transfers are to be made only under special circumstances. How these rules have been abused will be seen further on in the notes regarding the present incumbents of the superior Accounts Establishment.

There are very many "deserving and qualified" Accountants in the Department, who, if the vacan-

The *President*—contd.

vies in the superior Accounts Establishment were not filled up by Royal Engineers, covenanted Engineers, Cooper's Hill men, Staff Corps officers, and Europeans appointed in India, could with advantage be promoted to the superior grades, and no doubt at a less cost to the State.

The ruling that the Government of India have the power of making special and exceptional appointments and dispensing with the examination under exceptional circumstances is likely to be open to abuse, and when the power is exercised will probably give rise to dissatisfaction among the members of the Department in general.

The rule laying down that Accountants promoted to the rank of Examiner need not expect promotion beyond the lowest rank of Examiner,—*i.e.* Examiner, 4th class, 3rd grade—is an extremely arbitrary one, and does not appear to be based on any sound principle at all. The reason advanced—*viz.*, to prevent the superior Accounts Establishment being increased to an unnecessary extent—won't hold water. There is no reason at all why the promoted Accountant should not be advanced if qualified, and it is not clear how his advancement will tend to increase the superior Accounts Establishment to an unnecessary extent. It is highly desirable that this rule (India Code, Chapter II, paragraph 61A, clause II) should be cancelled.

Superior Accounts Establishment.

Present Strength.

In the superior Accounts Establishment there are at present—

11 Royal Engineers,
5 Staff Corps officers,
16 Cooper's Hill Engineers,
2 Engineers under covenant,
About 40 European Civilians appointed in India,
1 Pure Asiatic,
4 Apprentice Examiners.

There is no doubt that the Royal Engineers are men of exceptional ability, and some of them are the best departmental officers in the Accounts Branch, but this is no reason whatever for their appointment to it. It necessitates an increased expenditure to the State, and 11 appointments, which of right belong to the Natives of India, are in this wise filled up.

Their work as Accountants must impair their efficiency as military officers. The amount of work they have as Examiners will not give them any time to keep pace with the modern scientific improvements in military warfare; they lose touch with their real profession and will no doubt be quite at sea if any necessity arises for their reversion to military duty.

The above remarks apply to Staff Corps officers also. They are said to be not equal to the Royal Engineers in ability, and not as good departmental officers; but here again are five appointments to which Natives of India are legally entitled filled by military officers who have abandoned the profession of arms.

Of late the appointment of Cooper's Hill Engineers to the Accounts Establishment has become rather frequent, and if nothing is done to stop the rush, they will swarm out every one else. These

The *President*—contd.

officers come out for the executive branch for which they have been trained in England at a great expense to the revenues of India, find it does not suit them, or they do not suit it, use their influence and get themselves transferred to the Accounts Branch, thereby wasting all the professional knowledge they acquired at the expense of the State. Here again 16 appointments which of right belong to the Statutory Natives of India are filled by Europeans and the Secretary of State's ruling is evaded.

The two Engineers under covenant also came out for the executive branch. In what way they left the sphere for which they were best suited by their early training is not clear, but two appointments are filled by Europeans to which Natives of India are entitled.

These may be subdivided into—

(i) Europeans appointed straight off to the Accounts Branch;
(ii) Civilians appointed as Accountants for a short period and then transferred to the superior establishment;
(iii) A few who have worked their way up and one or two who came out as Accountants from England.

There are about 11 in No. (i) subdivision, civilians appointed straight off to the Accounts Establishment: almost all of these are Europeans. Among these are—

Mr. Hutchinson appointed in 1871.
„ Hubbard „ 1872.
„ McPherson „ 1874.
„ H. Rainie „ 1876.
„ Stuart „ 1878.
„ McPherson „ 1878.
„ S. Yeats „ 1878.

In subdivision (ii) are many who were first appointed as Accountants and then transferred to the superior establishment. Several of these are the sons of influential gentlemen, and were apparently put into the subordinate establishment as a temporary measure and then transferred to the officer grade in the course of a year or two.

The following are examples:—

Name.	First appointment.	Date.	Date of transfer to superior establishment.
Mr. Barrow .	Accountant, 3rd grade.	May 1874	April 1876
„ Braddon .	Accountant, 2nd grade.	Sept. '71	Jan. '74
„ Dennys .	Subordinate Establishment.	Nov. '75	April '76
„ Douglas .	Ditto.	July '72	Feb. '73
„ Hickie .	Accountant, 3rd grade.	Sept. '78	Octr. '81
„ O'Donoghue	Accountant, 4th grade.	April '73	Sept. '76
„ Volkers .	Accountant, 3rd grade.	Sept. '78	May '81

and so on.

The above are examples of the abuse of the rules referred to before and evasions of the Secretary of State's ruling regarding the non-employment of Europeans in India.

The *President*—contd.

Of subdivision (iii) nothing more can be said than that most of them are Europeans in the statutory sense.

Of the whole 40 civilians appointed in India it can be safely estimated that more than half are Europeans, and here again are upwards of 20 appointments which should rightly be filled by Statutory Natives otherwise filled up.

Mr. Prem Nath is the only pure Asiatic who has been appointed to the superior establishment. No comment is here needed.

The whole four Apprentice Examiners are apparently Europeans. Two of them do not appear to have passed the qualifying examination.

To briefly summarise what appears necessary may be stated as follows:—

(i) To do away with nomination by the Accountant-General, Public Works Department, and fill appointments in the superior Accounts Establishment by open competition.

(ii) Alteration of the rules so far as admitting Executive Engineers and Assistant Engineers to the Accounts Establishment is concerned.

(iii) Cancelment of the rule barring an Examiner promoted from the subordinate establishment being promoted beyond the lowest grade of Examiner.

(iv) Making the advancement of deserving and qualified Accountants to the superior establishment the rule and not the exception.

(v) Restricting appointments to the Natives of India and the framing of such stringent rules as will prevent the evasions practised in this Department as well as in others.

(vi) To do away with the grade of Honorary Assistant Examiner, which is only a compromise, the necessity for which will not exist if the other grievances are remedied, and promotions from the subordinate to the superior establishment freely made.

2. Subordinate Accounts Establishment.

Comparatively there is not much to mend here. In Madras the appointment of 5th grade Accountants has a deteriorating effect. The starting salary offered (₹30) does not attract the best men. In other parts of India first appointments are to the 4th grade, and the salary as a probationer is ₹60. The work is the same here as elsewhere.

THE PUBLIC WORKS DEPARTMENT.

Upper Subordinate Establishment.

Here again the rules of the Department are in favour of Europeans.

The European soldier pays nothing for his books and his education, and is yet guaranteed an appointment in the Madras Public Works Department.

He draws his pay while in College and on passing out receives an outfit allowance of ₹150 and is posted to the Overseer 1st grade; while a Native student who may have passed a better examination is not guaranteed an appointment, and if he ever does get one, he must enter in the Overseer 3rd grade.

The *President*—contd.

In 1882, when passed military students were first appointed Apprentice Overseers, 1st grade, care was taken that all the Military Overseers of the 2nd and 3rd grades should not suffer by this step. They were all promoted to the Overseer 1st grade, but the unfortunate Civilian Overseers of the 2nd and 3rd grades had nothing done for them. They were then superseded by so many military men that they have not yet reached the Overseer 1st grade.

Code paragraph 110 has been a dead letter from 1882, as no Civilian Overseer has been appointed an Apprentice Overseer.

The employment of Military Overseers was condemned by the Committee of 1870, and at the present time their employment at such great expense seems quite unnecessary and impolitic. Moreover, most of the Military Overseers are men born in India and who have enlisted only to enter the Public Works Department.

From January 1883 to date the following appointments of each class have been made:—

Military candidates, Overseer, 1st grade, 17.
Civilian candidates, Overseer, 3rd grade, 7.

There are at present about a hundred passed men (B.C.Es., A.C.Es., Supervisors, and Overseers) clamoring for any employment, and who by the present rules of the Department have no chance whatever of entering it.

The new rules promise that all vacancies in the Department after 1890 will be given to the best of the future passed students of the Civil Engineering College, and this will only accentuate the misery of the present applicants for employment.

Where are such a number of men to find employment? The new lines of railway in the Madras Presidency are being worked by foreign officers and subordinates. And when this Government treats its passed men so badly, is it likely that any foreign Government would treat them better?

It must be said to the credit of the Madras Government that it did its best to rectify in some way the injustice shown to Civilian Overseers, but it was overruled by the Government of India (*vide* G. O. No. 1291 W. of 23rd May 1880, and Chief Engineer's Circular Note No. 1902 C. of 21st May 1886).

CLERICAL ESTABLISHMENT.

General.

In the various departments under the Madras Government the rules regarding the appointment of Europeans to posts on salaries of ₹200 and above are not observed.

To evade the ruling of the Secretary of State the sanction of the Government of India was applied for and obtained to consider "the several departments of the Madras Secretariat as a single office for the purposes of recruitment and advancement" (Government of India letter No. 709, dated 23rd May 1881).

Against this combining of offices simply to

The *President*—contd.

advance a single individual there are the following points to be considered:—

(*a*) Each Secretariat requires in an Assistant a special knowledge of its several codes and rules, *e.g.*, the Chief Secretariat—a knowledge of Civil and Criminal Law, the Civil Account Code, &c.; the Revenue Secretariat—a knowledge of Revenue Law; the Military Secretariat—a knowledge of Military Codes and Rules; and the Public Works Secretariat—a knowledge of the Public Works Code.

(*b*) The Public Works Department required a special entrance test for all posts above R50. The examination is in the Public Works Code; and as a consequence of appointing outsiders from other departments as assistants in the Public Works Secretariat, these latter have to be exempted from this examination which every R50 clerk is compelled to pass.

(*c*) If the Secretariat offices are to be considered a single office for the purposes of recruitment and advancement, then all the clerks should be borne on one register for purposes of promotion, but this is not so, and the rule is only in force when a European is to be put into a post from which he is excluded by the Secretary of State's despatch No. 9 (Public), dated 10th July 1879.

(*d*) The power of combining offices and departments to enable Europeans to be appointed to posts of R200 and upwards should, it is urged, receive the prior sanction of the Secretary of State whose order it thus militates against.

Appointment of Mr. Bird as Second Assistant in the Public Works Secretariat on a salary of R300. Mr. Bird is a European, and not having entered the Public Works Department before 1st January 1879 could not be appointed or promoted to the Second Assistant's post in that Department. His appointment is said to be covered by the order of 1881 making all the several Secretariats a single office. The evil result of the order of 1881 is here clearly seen, for this very Mr. Bird twice appealed to the Secretary of State for exemption from his order of 1879, and was distinctly refused. By a side wind he thus obtained one of the plums reserved for Natives of India.

The Public Works clerks are the only clerks on a graded list, and the salaries of the various grades have been so exceptionally arranged that the maximum of a grade is the minimum of the grade above it, thus shutting out all chances of acting allowance for doing duty of an absentee senior.

You have no personal knowledge of the Engineering Department?—No.

Do you know whether it is true that the last witness was superseded?—Yes. Men below him got promotion to the post of temporary Engineer which gave them R100 more.

Why was that done?—I do not know. The Chief Engineer knows.

The *President*—contd.

Has he ever been put to act as Executive Engineer?—He was in charge of B project division for some time.

Has he been passed over more than once?—Yes.

Has any Native been put over him?—Yes; a Native Assistant Engineer. His absence on furlough would account for some of his supersessions.

Would that account for his supersession by the Native?—I do not think so.

Do you know Mr. ?—Yes.

He was promoted from the upper subordinate grade?—Yes.

Can you name any executive charge that he held?—Yes; he held the Buckingham Canal division among many others.

Is the whole of the Buckingham Canal one charge?—Yes.

Do you know Mr. ?—Yes.

Did he ever take charge of an important work?—Yes; the Burger Ghât among others, and he had also had charge of divisions.

Was he also promoted from the upper subordinate grade?—Yes. He was originally a soldier. In former days, promotion was allowed of upper subordinates to be Engineers, and there were many such promotions. Mr. was well known as a good irrigation Engineer, and he had been an upper subordinate.

Do you know Mr. ?—Yes.

Was he recommended for promotion to the Engineer grade?—Yes; he and Mr. together.

You complain of having been twice superseded in your office?—It was not supersession exactly, but two Europeans have been brought into the office.

And you say that that is contrary to the Secretary of State's order of 1879?—Yes.

How do you make out that the rule was altered in order to meet Mr. case?—Application went to the Government of India, and sanction was received. He was first brought into the Public Works Secretariat on R330. From R330 he rose to R350 in the Public Works and from that he went to the chief Secretariat on R600.

Mr. is a European too?—He is. He joined the Civil Secretariat, then entered the Military Secretariat, and from the Military Secretariat entered the Public Works Department.

Mr. *White.*

In those Secretariats was he drawing R200?—No.

You know the Public Works Code very well?—Yes.

By that Code Assistant Engineers must undergo a professional examination?—Yes.

Have any of those Engineers appointed since 1882 passed this test?—Some have not.

Have the Native Engineers who were appointed since 1882?—Two of them have.

Mr. *Ramaswami Mudaliyar.*

Have those gentlemen who have not passed tried to pass and failed?—I only know they have not passed.

India.

P. W. Department.

Section III.

J. R. Upshon, Esq.

Mr. *Ramaswami Mudaliyar.*—contd.

Are there many who have not passed?—About half a dozen.

Have they been promoted?—No.

(The Departmental Member here observed that the examination was not regarded as seriously intended to be passed.)

Mr. *White.*

Have any officers failed to pass the vernacular tests?—Some have.

Mr. *White*—contd.

What action does the Department take in such cases?—The promotion of the officer in question is delayed, and a warning is sent to him.

How are promotions in the Engineer Department regulated?—By seniority.

Strictly by seniority?—The Chief Engineer is supposed to know the character of his Engineers.

WITNESS No. LXII.—*12th August 1887.*

B. Stephens, Esq.

Examination of B. STEPHENS, ESQ., Local Fund Engineer, Coimbatore District.

Witness handed in the following note:—

In order to show the disadvantages under which men of this country suffer in the Public Works Department, I beg permission to make some true statements regarding myself while I was in that Department, which I am sure will show that the present system of filling up the higher grades in the Department requires to be completely changed or greatly modified. I ought to say at once that I do not at present belong to the Public Works Department. I left it in 1879. I have come forward before this Commission quite disinterestedly, as I can now neither gain nor lose by any changes that may be made in the Department.

I passed out of the Madras Civil Engineering College and joined the Public Works Department in the year 1864,—that is, 23 years ago. As an Overseer I worked up to the year 1870; I was then promoted to the Supervisor grade, and ever since then have been in charge of either a division, subdivision or a whole district,—that is, for the last seventeen years I have been doing the work of either an Assistant Engineer or Executive Engineer.

In the year 1877, while in the Tanjore District, I received a telegram to join the Buckingham Canal. I there took charge of a subdivision from Mr. Russell, an Assistant Engineer. In a short time I finished the work in that subdivision and took over another subdivision. This was the most difficult portion of work on the whole canal. The District Engineer in his report to Government, No. 1560, dated 19th September 1878 (copy attached), stated that I succeeded in doing portions of this work where Engineering officers had failed, the water difficulty having proved so great. Within a month after I took charge, Captain Henderson, who was in charge of the division, inspected the work and expressed his admiration at the wonderful change and rapid progress that had been made, and within two months after, I passed the first boat through the nine miles of this subdivision. All this great work was done without the use of a single pump, or picottah or baling basket, while, before I took charge, hundreds of pumps, picottahs, and baling baskets were used without making any appreciable effect on the water. I firmly and truly believe that in the method I adopted I saved Government nearly one lakh of rupees in this one subdivision alone. While thus engaged, I received orders to take over the whole division from Captain Henderson. This was in addition to my other charge. A few months later, I took charge of the Northern Division from Mr. Grosselliers, a Bengal Executive Engineer. These two divisions comprised 83 miles of the canal. My brother, Mr. J. H. Stephens, now in the Department, who was also a Supervisor at the time, was in charge of the Southern Division of the canal from the Pulicat Lake to the Pennar River, about 90 miles of the canal. He can give useful information if called for. He is now an Honorary Assistant Engineer. My expenditure at this time was about R50,000 a month. There were about 20,000 people working under me daily,—*vide* letter No. 1560 of 19th September 1878 from District Engineer to Government (copy attached). To control and get work from this vast mass of people, I had a large establishment of European and Native Overseers, Native Sappers, &c. I can unhesitatingly say that, though only a Supervisor at the time, I was put in independent charge of the largest, the most costly, and the most scientific work in the whole Presidency. Many Executive Engineers and Assistant Engineers were at the same time employed in Famine coolie camps, petty road and tank repairs, or other insignificant famine works. It will not be hard to see why I was given this large and distinguished charge. The authorities knew their men and gave them work accordingly. At this momentous time, Royal Engineers or Cooper's Hill men were not thought of. It was the best man for the best place. I say all this not to praise myself, for praise or blame will not affect me now, as I long ago left the Department. I held this large charge till the end of 1878, when the canal was opened out for traffic and almost all work on it was stopped.

I would now draw particular attention to the fact that, after all the work was done, I was put back to my subordinate position. I was put under an Engineer who refused to put me in charge of a small subdivision under him. The work I had done for Government at a trying time, my labour, anxieties and achievements were all clean forgotten! I was still a subordinate and would have remained a subordinate to the end of my days if I had remained in the Department. Fortunately for me there was a reduction soon after in 1879. Men were invited to retire. I availed myself of the offer and left the Department in disgust. With me, other worthy men also left, such as Messrs W. Donoghue, C. Seton, &c. These are men of character and ability, who are able to hold their own with the best Engineers in the Presidency. We joined the Local Fund Department, and have all risen to be District Board Engineers—a position we never could have attained had we remained in the Public Works Department.

My present work extends over an area of between 6,000 and 7,000 square miles.

It must be clear that, when men of exceptional ability had to leave the Department in order to better themselves, the organization of the Department must be faulty. Through this faultiness, men who are of value to Government and to their country are either lost to the Department in which all their training was received, or if they are obliged to remain, are kept down to brood over their hard lot, with all the life and vitality taken out of them. Many of the Sub-Engineers now in the Department are men who would shine in the upper grades if they were allowed a chance. But it is to be hoped that a brighter day is now about to dawn for the men of this country.

If the subordinates are to be justly treated, and if the best materials to be had in the country are to be drawn to the Department, the higher grades must be opened out to men who have proved themselves by their work and character to be fit for promotion. All restrictions should be removed. A man should feel that his promotion and advancement depends on his ability and character. If even only one such promotion from the subordinate grade is made every year, a spirit of rivalry will arise, which will be good for the Department and good for the country.

It may not be out of place to remark that if the men from Cooper's Hill receive "a highly specialised and elaborate training," as remarked by one of the witnesses before this Commission, then it is a fact that part of it is forgotten within a short time after their arrival in this country, and the remainder is seldom or never brought into requisition. The great bulk of the work to be done in the Public Works Department is of such a nature that a highly scientific training is not absolutely necessary. The bulk of work to be done is almost entirely confined to estimating and measuring earthwork for tank and channel repairs. I do not hesitate to say that within the last 10 or 15 years there has hardly been one work done by the Public Works Department that an experienced Supervisor or Sub-Engineer could not have designed and executed. Next in importance to the Buckingham Canal, already referred to, comes the Sungam project just finished, but, as is well known, this project was all designed by the late R. Smith, who was once one of the upper subordinate grade; and there are many other upper subordinates in the Department who can do as well as he did. The only real scientific work that I did was not when I was in the Public Works Department, but after I left. This was an iron girder bridge. The design for this bridge was placed before a Cooper's Hill Engineer, and this "highly specialised" and elaborately trained young gentleman confessed before his superior, who was a Royal Engineer officer of standing, and in my presence, that he knew nothing about iron girder bridges. Since this bridge was built, the present Governor, during his recent visit to Coimbatore, was taken to see it, and in the description given in the *Madras Mail* it was described as "a masterpiece of Engineering ability."

It is, for the reasons given above, useless and misleading to place so much stress on an elaborate English training, and to make it the reason for depriving tried and worthy men of this country of the position and emoluments to which their experience, work, and character entitle them.

I would, in conclusion, remark, that besides being excluded from promotion into the higher grades of the Department, civil subordinates—that is, the men of this country—are superseded by military men without rhyme or reason. This is a fact that can be illustrated from my own experience. When I was on the Buckingham Canal, and had the largest executive charge in the Presidency, and was expecting to be made an Assistant Engineer for my work, a military man who had gone to England on a long furlough, and who did not do one day's work during the trying days of the famine, came out just as a vacancy occurred in the Sub-Engineer grade, and though he was my junior in position and service, he was promoted and I was left out. See copy of report No. 1560, dated 19th September 1878, from the District Engineer to Government. It will speak for itself.

I strongly and earnestly advocate fair play between military and civil subordinates, and the opening out of the higher grades to deserving men, without reference to caste, colour, or creed.

Extract from a letter, No. 1560, dated 19th September 1878, from the District Engineer, Nellore, to the Secretary to Government, P. W. D.

I have the honour to submit for the consideration of Government a letter* from Mr. B. Stephens, Supervisor, 1st grade, complaining of his supersession by Supervisor Lennon, who has been recently promoted to Sub-Engineer, though he is Mr. Stephens' junior in the Department.

* No. 1249, dated 6th September 1878, sent in original.

* * * *

I know a great deal of Mr. Stephens. He served under me for three or four years in Tanjore, and for the past 16 months on the Buckingham Canal.

* * * *

Mr. Lennon has been promoted over the heads of eight men senior to him, some of whom have been working very hard and endangering their lives during the past two years on Famine duty.

Mr. Stephens is one of these men. He has been employed on the Buckingham Canal since the 8th June 1877; he has had divisional charge of the 83 miles of the canal from the Penair to the Romperu since 22nd February 1878, and he is still in charge of the division; he has had as many as 20,000 coolies at one time on his work; and he has managed the work, the people, and the necessarily large establishment under his orders satisfactorily; he has succeeded with portions of the work where Engineer officers have failed; he has been working literally night and day, and he has, I beg respectfully to say, more grounds to complain that his junior should be preferred to him for promotion.

* * * *

It is probable, however, that in this case I am to some extent responsible for Mr. Stephens' disappointment by not urging his claims in the periodical returns more strongly than I have done, and for this reason I beg respectfully to request that Mr. Lennon's supersession of him may be reconsidered.

India.
P. W. Department.
Section III.
B. Stephens, Esq.

Mr. , who is now dead, rose from the subordinate department to be Executive Engineer. He designed the Ganjam project. Other officers have similarly risen and obtained posts as Superintending and Executive Engineers. I know the works carried out by him; they were important. I know several men who have risen and taken a good social position, and I know there are men now in the upper subordinate ranks of the Department who, if they were promoted to the superior grades, would prove efficient in professional knowledge and hold their own in society.

Promotion from the upper subordinate grade to the superior grade would attract good men to the upper subordinate Service.

My work is, I believe, thoroughly approved. I believe that a sufficient education for employment in the higher grades in the Public Works Department can be obtained in this country. A good Cooper's Hill man will take some time to become efficient in this country; on the average five or six years are simply wasted in his training. An officer locally appointed can master what is necessary in a year. Special works, such as highly-finished architectural works, buildings, and railways, should be entrusted to men brought out specially, but for ordinary work we have sufficiently good men among those trained in India.

Cooper's Hill men do not expose themselves much in the sun. They go home as soon as it gets a little hot. Natives and Eurasians stand the climate better. European subordinates as well as European officers soon get knocked up with the heat. The Native and Eurasian Overseers remain on the work. I have now 17 Overseers working under me, and not one of them is European, and works are progressing of all descriptions.

WITNESS No. LXIII.—*12th August 1887.*

Narainsawmi Mudaliyar, Esq.

Examination of A. NARAINSAWMI MUDALIYAR, ESQ., Supervisor, 1st grade, Public Works Department.

The *President*.

The introduction into the Department of military subordinates as 1st grade Overseers and of Engineering graduates as 2nd grade Supervisors is a great obstacle to the promotion of deserving Overseers who enter in the lower grades of the service. In 1867 I entered the Department as an Overseer of the 3rd grade. I have now 20 years' service and have been for five years in charge of a subdivision. I relieved an Assistant Engineer and was relieved by an Assistant Engineer; yet I have been superseded by 15 Engineering graduates

The *President*—contd.

and military subordinates. In consequence of this, although four years ago I was recommended for promotion, I have not as yet been promoted. I contend that all who seek employment in the upper subordinate service, Public Works Department, should enter it in the 3rd grade and rise by merit. Promotion is given by seniority in grade, consequently men junior to me in service have been promoted before me because they have entered the service originally in a higher grade than I did.

WITNESS No. LXIV.—*12th August 1887.*

R. Vaithianatha Aiyar, Esq.

Examination of R. VAITHIANATHA AIYAR, ESQ., B.A., B.C.E., Sub-Engineer, Public Works Department.

Witness handed in the following note:—

The Engineering establishment of the Public Works Department is recruited from the Cooper's Hill College and the Local Civil Engineering College. The Engineers coming from Cooper's Hill have always been appointed, in the first instance, as Assistant Engineers, 2nd grade. Till the year 1874, Natives coming out of the Local Engineering College were admitted only in the subordinate grades, while *Europeans** coming out of the same College *with less qualifications* have been taken into the Engineering establishment. In G. O. No. 1237 of 14th May 1872, the Government having guaranteed one Engineer appointment annually to the senior department of the Civil Engineering College, Mr. N. Ratnasabapathy Pillai was appointed a probationary Assistant Engineer in 1874. This guarantee induced several others, members of very respectable families, to take up this branch of the public service. In the year 1875 none passed the B.C.E. degree from the College. Mr. T. T. Raghavachariyar, who had taken the B.A. degree in 1872 and served in the Educational Department for two years, having been induced by the above-mentioned guarantee, resigned his appointment in the Educational Department, joined the C.E. College and passed the B.C.E. degree in 1876 in the 1st class. The director of Public Instruction wrote to the Government to give him the guaranteed appointment. But the Government in G. O. No. 1354 of 31st May 1876 replied that "the Director of Public Instruction was not warranted in stating in his report for 1871-72 that the Government had unconditionally guaranteed one Engineer appointment annually to the senior department of the Civil Engineering College . . . . . T. Raghavachariyar will be appointed as a probationary Assistant Engineer on the occurrence of the first vacancy." Mr. T. Raghavachariyar still remains in the subordinate grades, though several vacancies have occurred since. Induced by the same pledge on the part of

* Lieut. R. F. Taylor, Mr. J. F. Gorman, „ A. W. Hunter, „ C. H. T. Norfor, Lieut. Greenaway. — Passed only A.C.E. from local College.

Mr. J. C. Johnstone, „ J. Montserrat, „ E. H. Pringle, „ W. S. Harrington. — Passed neither from Cooper's Hill nor from local College.

the Government I joined the College in 1875 and took the B.C.E. degree in 1877. The Government having declined to appoint Mr. Raghavachariyar in 1876, I had also to enter the Department in the subordinate grade and still continue to be so in spite of the strong recommendations of the officers under whom I have served. Here I may state that nothing but the inducement of obtaining an Engineership at the outset made me adopt Engineering as my profession. I am a man of independent means, paying Government a yearly revenue of about R7,000, and holding property yielding a yearly income of R20,000. I entered the subordinate grade with the entire confidence of attaining to the position which was guaranteed to me by the Government. In 1878, S. Venkat Ramana Puntulu passed the B.C.E. examination and met with similar disappointment. But in the year 1880, Mr. S. Gopalakrishna Aiyar, who passed the examination in that year, was appointed Assistant Engineer, 2nd grade. I sent a memorial protesting against the appointment, and had the following reply:—

No. 1120c.

H. E. No. 754, dated 21st May 1883, from the Superintending Engineer, V Circle.

Supervisor R. Vaithianatha Aiyar submits, through the Superintending Engineer, V Circle, a petition in which he prays that he may be appointed an Assistant Engineer.

2. The grounds on which he bases his claim are that he took the B.A. degree in 1875 and the degree of B.C.E. in 1877, and was appointed to the Public Works Department as Supervisor in March 1879, whereas S. Gopalakrishna Aiyar, who passed only the first examination in Arts (inferior to the B.A. degree) and the B.C.E. degree in 1880, was appointed in that year an Assistant Engineer.

3. The Chief Engineer observes that in spite of the best intentions of Government, inequalities have existed in many cases, and that it would be quite impossible to redress such inequalities further than as opportunity may offer for the promotion of really deserving men. There are no doubt several others somewhat similarly situated, and the attempt to introduce principles of supposed equity viewed from one standpoint would end in introducing a number of other anomalies which would lead to well-grounded discontent.

4. Should the recent proposals of the Chief Engineer for dealing with the Civil Engineering College curriculum meet with acceptance, many of the anomalies hitherto prevailing would disappear, as all students appointed to the Department would enter in the upper subordinate grade and would have an equal chance of rising by merit to the position of Assistant Engineer.

5. At present there is a higher and lower class in the College, and men who passed out in the former have accepted a low grading in entering the Department, and thereby interfere with what may be considered the rights of those in the lower class.

6. The claim advanced by R. Vaithianatha Aiyar is unusual and cannot be listened to, but, with approved service and good conduct, he may look to fair promotion in the Department. He accepted his position with his eyes open, and if now promoted in the manner prayed for, there would be many others who would have just cause to complain of supersession.

From paragraph 6 of the above it will be clear that I have been promised promotion to the Assistant Engineer grade with approved service and good conduct. Although this promise was made in 1883, it remains yet to be fulfilled, notwithstanding the strong recommendations to the Government from an officer of such long experience as Colonel H. L. Prendergast, R.E. Such are the prospects of qualified Natives in the Public Works Department.

The duties of the Department require constant travelling, and every member of the Department *must* and *does actually travel*. The Natives of the country being inured to the climate would certainly be able to endure the tropical heat much better than Europeans. I am sure there has not been a single instance yet in which Native subordinates or officers have been reported as being bad riders or unable to endure the climate of the country, while some European Engineers have never been found to ride, but always drive or walk. It will be seen from the departmental returns that Native subordinates have only very rarely availed themselves even of their privilege leave, while European officers and subordinates unable to endure the heat have been availing themselves of all kinds of leave.

The works with which officers of the Public Works Department have generally to deal appertain to the enclosing of new tanks and keeping up the existing ones in case of the dry districts, and in the delta districts to river irrigation. Having a knowledge of the vernaculars, the manners and customs of the people, and the requirements and available resources of the country, Native officers must be better able to secure ready co-operation of the ryots and to arrive at a ready decision in cases of emergency. The D. P. W. subdivisions which generally comprise from two to three taluqs are intended for Assistant Engineers. And still there are more than fifty subordinates holding charge of subdivisions. Thus it will be seen that the subordinates really do the work of the Assistant Engineers without their pay and rank.

I have been in charge of a subdivision for nearly six years out of a total service of eight years. This subdivision comprised more than two-thirds of a district with about a thousand tanks, besides a large number of river-channels. During the floods of 1884 there were breaches on all sides, no less than a hundred and fifty irrigation works having suffered damages all at once. I went round on horseback inspecting all these works and adopting on the spot ready restorative measures on my own responsibility. Thus it will be seen that any insinuation that Natives are unfit for outdoor work, that they are not resourceful under difficulties, and that they are afraid of assuming responsibilities, has no foundation whatever. The education given in the local Engineering College is ample for the requirements of the Department, Training in workshops is not at all necessary, although it may be an accomplishment; for a Civil Engineer has rarely to go to a workshop, except

India.
P. W. Department.
Section III.
R. Vaithianatha Aiyar, Esq.

when he requires screw gearings or gearings for lock gates. Like Natives from local colleges, the Cooper's Hill officers acquire experience and knowledge of works only by observation and study of the existing works in India.

As for the charge that Natives are wanting in faculty for designing, the existing works of purely Native production in the Cauvery Delta are enough to disprove it. In the following extracts from Professional Circular No. 37, dated 5th July 1877, Colonel Mullins, than whom there has not existed an abler Engineer, has noticed the designing capacity of Native subordinates as follows: "The replies which have been received to Memo. No. 4 C. of 1876 indicate that, with some few exceptions, District and Executive Engineers have been in the habit of leaving the designing of masonry works far too much to Native subordinates. . . . . The undersigned gladly recognises the fact that much excellent designing has been done by members of the upper subordinate grades, while in some instances a marked capacity for designing has been evinced by them." Type designs have been issued for all descriptions of work required in this country, and any departure from them is not approved. The officers and subordinates have only to adapt and suit them to the requirements of each case. As regards the designing capacity which European Engineers in general are alleged to possess in such a remarkable degree, I can state that when the Madras Government wanted recently a Consulting Architect they had to send for one from Bengal. One Madras officer, however, was given a trial as Consulting Architect, but was not permanently appointed.

The changes I would have in the Department are—(1) that all Overseers should be Natives, as these have to deal directly with workmen and ryots; (2) that all B.C.Es. should enter the Department as Engineers on probation; (3) that Cooper's Hill College should be closed as far as India is concerned; (4) that persons qualifying themselves for service in the Public Works Department should also be employed in the Survey Department; (5) that subordinates with approved merit and experience should be admitted into the Engineering establishment; and, lastly, that the Classified List should be published according to rank, so that every member may know his relative position in the Department.

The *President.*

I have been for two and a half years a temporary Assistant Engineer. The subdivision of which for ten years I was in charge was one set apart for Assistant Engineers. I have been recommended by Colonel Prendergast for permanent appointment as Assistant Engineer.

Mr. *White.*

I should not have entered the upper subordinate grade if I had not counted on promotion to the superior grade. I got on well with European and Eurasian members of the Department. They have always been courteous to me. I have had to do business with the Sub-Collector and Joint-Magistrate of the district respecting irrigation works, and I found no difficulty in it.

WITNESS No. LXV.—*12th August 1887.*

Examination of COLONEL H. M. VIBART, R.E., Superintending Engineer, Madras Circle.

The *President.*

When did you enter the Department?—In 1859 or 1860. I have served in Tinnevelly, Trichinopoly, North and South Arcot, Chingleput, Kistna, Kurnool, Cuddapah, and Bellary. I have had much experience in irrigation works.

Have you had any experience of Civil Engineers educated at the Madras Engineering College?—Yes.

Were they men of Asiatic parentage?—Yes.

Have you had no European or Eurasian subordinates who have been educated at that institution?—I have had military subordinates; I have also had East Indians under me.

From what you have seen of men educated at the College here, what opinion have you formed of the sufficiency of the education given in that institution to qualify candidates for employment in the higher grades of the Public Works Department?—I do not think that either the technical or the general education of the men was sufficiently good.

In what respect did they appear to be wanting in technical or general education?—It seemed to me that they very often had acquired but a mere smattering of knowledge which they found altogether insufficient when brought face to face with practical work.

Have you had any Rurki men under you?—No.

Comparing the men educated in the Madras College with those of your subordinates who have been trained at Cooper's Hill, which do you consider superior?—I do not think it is possible to make any comparison between them, the Cooper's Hill men being so very much better in every respect.

The *President*—contd.

Which system do you think would give us the better officer—the system which brought out the Stanley Engineers or the system of recruiting from Cooper's Hill?—I should be inclined to think the Cooper's Hill system was the better.

Judging from the men who have served under you?—Yes.

Do you consider that the training given at Cooper's Hill secures efficient officers for the Public Works Department of this country?—I think so decidedly.

Comparing the Engineers educated at Cooper's Hill with the Royal Engineers as a class, which do you consider superior?—I am inclined to think the Royal Engineers the better, perhaps because they have had a military training and were longer together in England before they came out to this country.

How many Assistant Engineers educated at the Madras Engineering College have you had under you?—Two; I have had altogether three Asiatic Native Assistant Engineers under me, two of whom were educated at this College.

The *President*—contd.

Are you in favour of promoting deserving officers from the subordinate to the superior Engineering establishment?—Unless in a very exceptional case, no.

Is it necessary to continue to engage the services of European Sappers in the upper subordinate grades?—Yes. I think they make very efficient subordinates.

Do you think we could substitute Natives for them?—Decidedly not.

Why not?—Because I think the European character is very much better; Europeans are much more manly, trustworthy, straightforward, and resourceful in emergency.

Have you had any educated Natives as Overseers or Supervisors?—Of late years I have.

How did they do their work?—Not particularly well.

Were they men who had taken an Engineering degree?—Some of them had.

In what respects did they principally fail?—They were not sufficiently active, nor did they take much interest in the country and the works that were going on in it. A European is fond of going about the place, of shooting, of riding, and all that sort of thing, so that he gets a better acquaintance with the country than a Native does.

Have you observed whether a Native is superior to a European by reason of his better acquaintance with the resources of the country?—I do not see why he should be. Of course if he is an active man he will probably get more quickly acquainted with such matters than a European; but I do not think it makes much difference.

It has been suggested to us that Natives have this advantage over Europeans, that they are more familiar with the material resources of the country and are therefore not so likely to be deceived as to prices?—I have not found it to be so practically.

Are European subordinates principally employed in military cantonments, or in district works?—They might be employed in cantonments, but I see no reason why they should not be employed in district works. I know a great many at Bangalore and have had them under me at Bellary; and there are numbers of them in these parts and in Chingleput.

What is your opinion of the older class of subordinates who entered the Department otherwise than through the Engineering College?—Some of them did very good work indeed.

Did they show any Engineering aptitude?—I cannot remember any particular instance of it.

Do Natives of this country show any peculiar aptitude for irrigation work?—I have not observed it.

For aligning distributaries, for instance?—One man I had at Kishna was perhaps rather good at that work. He is now Honorary Assistant Engineer. He is a Mahomedan.

Had he been trained at the College here?—No. He obtained his first appointment in the Department after the Cyclone of 1864. He was at that time a clerk in the Superintending Engineer's office, and we were very anxious to get anybody to assist. He showed himself very active, and the Superintending Engineer afterwards got him into the Department as Overseer.

The *President*—contd.

Do you know Mr. ?—Yes.

He was born in this country?—Yes.

He also is an Honorary Assistant Engineer?—Yes.

Is he a competent Engineer?—I think he is a very good man and unusually competent.

To what extent might we increase the Native agency in the upper subordinate and superior grades of this Department?—Not at all in the superior grades.

Are there no men in this Presidency who would be able to undertake the ordinary petty works of a district?—They might be able to undertake it, but I doubt whether they would do so efficiently.

Are there not a considerable number of Local Fund Engineers now employed in this Presidency who were educated at this College?—Yes.

Do you know many of them?—No. I believe some of them were in the Department.

Do you consider there is any ground for the complaint that, owing to the engagement of so many military men in the upper subordinate branch, the promotion of Natives in that branch is very much impeded?—There are a good many military subordinates, but many of them have been a long time in the Department and entered it at the time when there were very few Natives who entered with them. When the College here was first started, the number of Europeans in the Department was large and the number of Natives was small, but since that time the number of Europeans has diminished and that of the Natives has of course largely increased.

A European upper subordinate cannot be promoted to the superior grade?—He may be made an Honorary Assistant Engineer, when his name would be kept on the list of Sub-Engineers. Several men have been promoted in this way.

Mr. *White*.

You are aware that some of the students of the Madras Civil Engineering College take their degree at the University. Does not that prove that the education they get in the College is not merely a smattering?—I do not know that it proves it particularly; but my opinion is that they have merely a smattering of professional knowledge.

Technical training will not of course supply practical knowledge?—You can, however, gain a great deal of practical knowledge while undergoing a technical training.

Is this technical knowledge absent from those men who have passed through the College and taken their degree?—I think it is in many cases.

How many Eurasian Assistant Engineers have you under you?—Only one, I think.

How many Europeans have you had in any subordinate capacity under you?—A large number; I do not know how many. I was at Bangalore for six years and had a number of them there, military subordinates among them.

India.

P. W. Department.

Section III.

Colonel Vibart, R.E.

Mr. *White*—contd.

From your experience of the one or two Native and Eurasian subordinates you have had, are you justified in saying that all Natives and Eurasians have only a smattering of professional knowledge, and that they are incapable of doing their work?—I have had several in the higher grades, and very many in the lower grades. I did not say they were incapable of doing their work as subordinates. I said they are not capable of performing the duties of Assistant and Executive Engineers.

Have you ever tried them in a superior capacity?—I have had three as Assistant Engineers under me.

Are you justified in generalizing from the opinion you have formed of the capacity for work of three men only?—I think so.

Did the upper subordinates who were promoted to the post of temporary Engineers do good service?—Some of them may have done so in their way.

After considering the names I will now read to you, will you say whether you adhere to the opinion you have expressed as to the unfitness of all existing upper subordinates for promotion? (*Reads names.*)—I do adhere to that opinion.

Have you any personal knowledge of the qualifications of these men?—I have of three of them.

You would not promote those three?—No.

And you would put a bar to the promotion of the other men, although you knew nothing or little about them? What is your objection to promoting them?—Judging from the other men I have seen I should be disinclined to promote them.

Do Cooper's Hill men pass the departmental examination for promotion to the Executive Engineer grade as soon as Natives do?—I do not know.

Are there not at present about half a dozen Cooper's Hill men whose services range from three to six years who have not yet passed that examination?—I do not know.

You say Natives are not resourceful. Are you aware that Sir Alexander Arbuthnot, while Acting Governor of Madras, expressed himself gratified by the services rendered by a Native Assistant Engineer (the only one in that grade he observed), who in circumstances of considerable

Mr. *White*—contd.

difficulty exerted himself so as to meet the approbation of his superiors on the occasion of the floods in Nellore; and are you aware that the same Executive Engineer particularly distinguished himself in an emergency arising out of the Mamandoor tracts being in danger, and was again publicly commended by Sir Alexander Arbuthnot on the report of his District Engineer? Now, having reference to the officer in question, do you still consider that Natives are not resourceful?—In this particular instance a Native happens to have done good work. I know the man personally and know him to be a good man—the best I have ever known.

He was educated in the Engineering College here?—Yes.

The *President.*

Had the Mahomedan whom you mentioned as a very good subordinate officer received a fair general education?—He is fairly well educated.

Does he speak and write English?—Yes. I understand he was educated at the Presidency College.

What is the nature of the departmental examination which Assistant Engineers have to pass before they are promoted?—It has reference chiefly to the capabilities of the district, what is to be found there, and so on,—things which a young Engineer straight from home would at first be rather at sea about. It is not an Engineering examination.

Is it an examination in the rules and regulations of the Department?—I do not think so.

What vernacular examination has an Assistant Engineer to pass?—He is supposed to have a certain colloquial knowledge and to be able to read and write. I do not know why any difficulty should be felt by them in passing it.

Mr. *White.*

They have not passed it, however, and do you think they show their superiority to the local men in that?—I do not know why they do not pass it, because I am perfectly sure if they tried they would pass it.

Is it that they are unable or unwilling to pass it?—Not unable certainly.

WITNESS No. LXVI.—*12th August 1887.*

Lieut.-Col. Pennycuick, R.E.

Examination of LIEUT.-COLONEL J. PENNYCUICK, R.E., Superintending Engineer, 6th or Trichinopoly Circle.

The *President.*

When did you enter the Public Works Department?—In 1862. Except when I was absent on field service in Abyssinia, I have never served out of this Presidency.

Have you had Natives of Asiatic parentage among your Assistant Engineers?—Yes; four or five were under me immediately. I was acting as Chief Engineer of Irrigation for six months and saw the whole of the Department during that time. I have had as much experience of Native Engineers as it is possible to have under the present circumstances.

The *President*—contd.

What do you think of them professionally?—I have not much fault to find with their actual qualifications, but I do not consider them at all fit for the upper grades of the Department. I have never seen one of them yet that I should desire to put in charge of an important executive division.

What defects have you observed in them?—Want of energy and power to control their subordinates, and want of readiness to accept responsibility which is a great defect. I do not attribute their defects entirely to their Asiatic origin, but rather to their early training. I think if you sent

The *President*—contd.

a Native to an English public school for two or three years and then passed him through Cooper's Hill, there is no reason why he should not make a good Assistant Engineer; but a man educated here would be very unlikely to succeed as an executive officer.

Have you had Europeans born in India or Eurasians under you?—Not from this College, because I do not think any have passed through the College into the Engineering grades; but during the famine I had several Rurki men under me.

What opinion did you form of them?—That they were immeasurably inferior to either the Cooper's Hill man or the subaltern of Royal Engineers. Out of the seventeen officers I had under me two were subaltern Engineers, one was a Cooper's Hill man and one a Stanley Engineer, and these four men did more work than all the others put together.

How many were Rurki men?—I think four.

I suppose in the famine time you had not much opportunity of gauging their technical qualifications?—We had opportunities of seeing what was much more important; that is, their energy and go.

Have you had any Eurasians under you?—Not in the Engineering grade.

Have you been an examiner at the College?—I have set papers occasionally. The last paper I set was in Hydraulics.

Did you see the answers?—Yes; they were very good indeed.

Were the Rurki men you mentioned young men?—Youngish men; they were all Assistant Engineers, mostly, I think, of from four to nine years' service, and quite enough experience to show what stuff they were made of.

You have had several Cooper's Hill men under you?—A great many.

What opinion have you formed of their qualifications?—I think they are as near perfection as anything we are at all likely to get by any system of selection. They are mostly men who have been educated in public schools and had the corporate training there and at Cooper's Hill which I think to be essential.

It has been said in the course of our enquiry that the best men of all classes are equal?—I have not seen any such equality. Three of my most important divisions are now under Cooper's Hill men.

You appear to think that no Rurki men could be good?—I do not say that. I can only form my opinion on what I have actually seen.

Is any very high degree of technical education required for the ordinary public works of a district?—I consider very high education is required for the work of this Department, and that a higher degree of technical skill is required than would be necessary in a Local Board Surveyor at home. Moreover, an officer of this Department has a good deal of work which is not purely technical; there is administration work.

You think there are qualifications other than technical which are requisite in an officer of the Public Works?—Yes; what may be known as social qualifications, the power of being on equal terms with the officers of other departments so as to avoid friction and awkwardness,—qualities which are very difficult to define.

The *President*—contd.

You are acquainted with the large irrigation works of this Presidency?—Yes.

Has an executive officer in the Irrigation Department to decide questions connected with water rates, &c.?—He has very often to discuss and give advice to the Revenue Department on important questions which arise from time to time.

Is it necessary to continue the employment of a large number of military upper subordinates?—I should be very sorry to see the number reduced. The military subordinates are undoubtedly the backbone of the subordinate establishment, and I should not like to see them go for very much the same reason that I think the Cooper's Hill men and subaltern Engineers make better officers than local Engineers. They have a better sense of discipline, by which I mean not only obeying orders, but the practice of working in concert with others, and a sense of responsibility as members of an important organization.

In what works are these military subordinates necessary?—They are not perhaps absolutely necessary, but whenever you want promptitude or hard work, or a man who will stick to his work, there is no man like the military subordinate.

The European soldier comes into the Department in the first grade of Overseers?—I cannot say that I approve of it personally. I do not think it is quite fair to the other members of the Department.

In Bombay they have fixed a proportion for European and Native subordinates?—Our present system was imitated from the North of India, whether in consequence of orders I am not prepared to say; but prior to that time Europeans and Natives entered the Department in the same grade and were promoted according to seniority and merit. They took their chance together. I do not think we have a better class of men now than we had then.

Would you promote from the upper subordinate to the superior grades?—Only in cases so exceptional that we cannot provide for them beforehand.

Do you know Mr. ?—Yes; and I think I may say broadly that he is the only subordinate I have ever known whom I could promote to the upper grade.

Would it be a good system to have one College in India for training men for the upper grades of the department and to utilize the other colleges for training men for the upper subordinate grades?—If you are to appoint men in India to the upper grades at all,—a thing I am very much opposed to,—it would. It is quite impossible to turn out men from the local colleges who would be fit for the upper grades. I do not, however, advocate the establishment of such a college; on the contrary, I consider that every man in the upper grade should be appointed in England. My theory is that the present system of training men through Cooper's Hill is so good that I can scarcely believe we could improve it.

Mr. *White*.

The man you mentioned as having been commended by Sir Alexander Arbuthnot showed, it is true, excellent resource and energy on one particular occasion, but I have known him when tried in superior grades, and he was found completely

India.

P. W. Department.

Section III.

Lieut.-Col. Pennycuick, R.E.

Mr. *White*—contd.

wanting. I had to take one important work out of his hands because I found he was muddling it.

You say the education given in the local College is defective?—On the contrary, I said the technical education given there was distinctly good. The defect I find is a moral one, which comes originally from the home training.

It is not the men themselves that you blame?—I blame nobody.

There is no defect in the men?—I am not sure there is not, as they are turned out of the College. I do not think they would ever turn out as good all round as the Europeans, but I think you might get a fair class of men by training them in the way I have suggested. But I do not think that any alteration in the system at present would give us the class of men we want.

Do you apply your remarks to the Eurasians and domiciled Europeans?—To a great extent. In point of fact, I think I would rather have as beginner under me a Native who has undergone the English training I have suggested, than a domiciled European who has simply passed through the local College.

Do you know that every military subordinate you have had from the Engineering College is a European domiciled or a Eurasian who has enlisted?—I do not know it, but if it be so, that is only an illustration of the necessity for the corporate training I have insisted on.

Do you think that domiciled Europeans and Eurasians of Madras could under the same conditions become the backbone of the upper subordinate service?—They might.

Would you promote any of that class who had shown themselves to be qualified in every respect?—No. As I understand the subordinate class, I think it is only in very rare cases that you should promote them to the Engineering grade; otherwise you spoil a good subordinate and make a bad Engineer.

Do you know that a certain gentleman from Cooper's Hill was tried in the appointment of Consulting Architect here and failed?—Cooper's Hill is a College for training Engineers, not Architects; though it is necessary that an architect should know something of Engineering. I know nothing at all of the appointment of Consulting Architect, nor do I think that capacity to hold it is any test of the ability of an Engineer.

You say that officers of the Engineering Department should occupy a certain social position?—Yes; I think it adds to their efficiency.

Is it not a fact that 999 officers out of every 1,000 who come to India owe their social position to their official position?—I do not know anything about their antecedents. I take them as I find them.

In India is it not official position that gives social position?—It does not give capacity for filling the social position. We have subordinates to whom we give honorary rank which gives them the social position, but as a rule they do not feel comfortable. I know from my experience that it is invariably the custom with every officer in the Department to treat an Honorary Assistant Engineer with the same courtesy as we would show to any other officer.

Mr. *White*—contd.

Are there not many gentlemen born and educated in India who hold considerable social position in Madras?—What I say is that a man who has been a subordinate for twenty years is not likely to fill a higher position with entire comfort to himself.

The *President.*

Have you had any Mahomedans serving under you?—Yes. I have one who is an excellent man, one of the best subordinates I ever had. He was under me in 1873 as Overseer in North Arcot; he is now Sub-Engineer in Madura. He is a very well educated man and a very superior stamp of man altogether.

Would it be possible to promote him to the superior grade?—I think not.

The following has been since received from the witness:—

With the leave of the Committee, I wish to add a few remarks to my evidence of yesterday upon two points of some importance concerning which the line of examination adopted did not give me an opportunity of expressing my views with sufficient clearness.

The first is as regards the promotion of subordinates or the appointment of men from the local College to the rank of Assistant Engineer. I have said that I consider such appointments inadvisable, but this does not mean that I consider such men, especially the former, incompetent to perform the duties of this rank. On the contrary, many of them are capable of performing these duties very fairly, though not as well as the average man from Cooper's Hill or Woolwich; and in fact the duties of an Assistant Engineer differ but little from those performed by the senior upper subordinates.

The incapacity is for filling the higher posts of Executive and Superintending Engineer, and it is on this ground that I am opposed to their appointment to the rank of Assistant Engineer.

The Assistant Engineers are the ground from whence we have to select our Executive Engineers, as the latter are the material for the Superintending and Chief Engineers; and it is bad policy to appoint to the lower grade a class of men whom you cannot hope to promote to the higher grades.

The result of such a policy is likely to be (in fact the result of the present system of appointing one man annually from the local College certainly will be) the formation of a group of elderly Assistant Engineers with no prospect of further promotion and no interest in their work, performing duties which would be more efficiently done by younger men.

And the efficiency of the Department at large will suffer, because if you have a considerable group of men unfit for promotion, those below them must pass over their heads and thus obtain at one part of their career a sudden and abnormal increase of promotion, which will interfere with the steady movement from lower rank and less important duties to higher rank and greater responsibility, which (setting aside isolated cases of exceptional capacity or incapacity) is essential to efficiency of any large organized establishment.

The *President*—contd.

The second point on which I wish to remark is as to the subordinate grades. The questions which were put to me led me to lay so much stress upon the superior qualifications of the military subordinates that it may be supposed that I held an unfavourable opinion of the other three groups (civil European, Eurasian, and Native) who make up the subordinate classes.

This is not the case. I have a very high opinion of the subordinates of this Department as a body, and have known excellent service done by many others than military men, though, on the whole, I consider the latter the best of the four groups.

I may add that I consider the general standard of efficiency amongst the subordinates to be very high,—much higher than it was twenty or even fifteen years ago.

WITNESS No. LXVII.—*12th August 1887.*

Examination of LIEUT.-COL. J. PENNYCUICK, Superintending Engineer, Public Works Department.

Lieut.-Col. Pennycuick.

The *President*.

Is it necessary to employ Engineers in the Public Works Department Accounts Branch?—The question is a difficult one to answer. As the Department is constituted at present, I think you ought to have at all events a sufficient leaven of them; but if the Department were constituted in the way I have advocated some time ago, it might be unnecessary to do so. As long as the Examiner of Accounts in the Department holds the position he does now, it is, I think, almost necessary that he should be an Engineer,—that is, a gentleman possessing technical knowledge and belonging to the same department as the Engineers whose accounts he is to examine. It would be, I think, almost intolerable to have an outsider in that position.

Is it necessary to employ Royal Engineers in this branch of the Department?—No; I make no distinction whatever as regards the capacity or functions of Royal Engineers and Cooper's Hill men. I think they stand precisely in the same position. The Examiners should, however, be men taken from the executive service.

Why do you require technical knowledge in the Accounts Department?—Because the Examiners have to deal largely with Engineering matters and to discuss them with Executive Engineers.

The *President*—contd.

What control have they in Engineering matters?—None; but it is very necessary they should be able to understand the reasons for things. If you ask me whether the present system ought to obtain, I say certainly not. I should like to separate the Accounts from the Department entirely, and it is mainly with a view to avoiding friction that I say the Department as at present constituted should be officered by Engineers. To enable the Department to do without Engineers you would have to make a very drastic change in the system.

It has been suggested that you really do not want Royal Engineers in the Department, but that every officer who will eventually have an executive charge should serve for a certain time—six months for instance—in the Accounts Branch in order to learn the system of account, so that when he takes up his executive duties he will find things smoother for him?—My suggestion was the exact opposite to that. It was that an Executive Engineer should have nothing to do with accounts at all, but should have an Accountant attached to his office, but independent of him, who should have the sole responsibility for the accounts.

WITNESS No. LXVIII.—*15th August 1887.*

Examination of A. M. MAURIAPA MUDALIYAR, ESQ., late temporary Sub-Engineer.

A. M. Mauriapa Mudaliyar, Esq.

The *President*.

What is your occupation at present?—I have none. I have been promised an appointment in this Department.

What appointment?—A suitable one.

What have you to tell us regarding the Public Works Department of this Presidency? (Witness handed in the following written observations.)

I am the eldest son of Subadar A. M. Vyapuri Mudaliyar, 1st Regiment N. I. (1st Madras Pioneers), and am one of the first two that passed very creditably the Civil Engineering College Examinationi n Engineering and Surveying in 1858. I served for nearly thirteen years in the executive branch of the Public Works Department, and for seven years as Engineering Assistant and Sub-Assistant Engineer on the South Indian Railway, and for about six years as Famine Relief Officer, Bellary; Municipal Manager, Vellore; and L. F. Assistant Engineer, South Arcot District. The last appointment I held was that of temporary Sub-Engineer, Public Works Department.

The *President*—contd.

My private business has compelled me to remain for the present in Madras, but I have been promised an appointment in the Public Works Department when I can take it.

The executive branch of the Department virtually consists of four classes of officers,—*viz.*, Engineer, Upper Subordinate, Lower Subordinate, and temporary maistris. There are too many highly-paid officers and subordinates in the Department and too few lower subordinates, whereas a good number of the latter subordinates on moderate salaries are indispensably required for the following reasons.

India.

P. W. Department.

Section III.

A. M. Mauriapa Mudaliyar, Esq.

The *President*—contd.

Each district is a division which is divided into two or three subdivisions, and each subdivision comprises two or three taluqs. An Assistant or Executive Engineer is placed in charge of each division, and a subordinate or an Assistant Engineer, and sometimes a Supervisor, is placed in charge of each subdivision. One or two Overseers are given to each subdivisional officer, and these Overseers are put in charge of a taluq each and if the Overseer is an experienced and willing man, his time is occupied in taking measurements and in estimating and preparing bills for the works carried out by the temporary maistris. These maistris are virtually in immediate charge of the works, and generally they join with contractors and permit bad work, but polish off the outer portions and the works are generally passed. If the subdivisional officer happens to be an honest and conscientious man, he examines and finds fault with such work, and when the Overseer is questioned he escapes by pleading absence and by throwing the blame on the coolie maistri, who does not care much for his employment. These Overseers, if new, are not useful in the least, and even if experienced Overseers are appointed, the works in their taluqs are so scattered and of such various natures, that they are obliged to entrust each work or cluster of works to the temporary maistris, who generally combine with the petty contractors, and the work is badly executed.

I venture to point out that generally the works are rarely carried out according to the standard specification in this part of the country owing to corruption as well as for want of close supervision by responsible parties. I therefore beg to suggest the increase of the staff of permanently-paid lower subordinates,—*i.e.*, Sub-Overseers of three grades at ₹50, ₹40, and ₹30 respectively, with prospects of pension; and these, if properly watched and held strictly responsible, will, no doubt, prove useful in checking a great waste of public money. These Sub-Overseers should be recruited from those persons who obtain certificates as Overseers, and such men as have proved perfectly honest should be promoted to the upper subordinate class, and those that climb up the ladder in that class and prove true to the salt of Government should be promoted to the grade of Assistant Engineer. At present those that come out of the Civil Engineering College with Overseers' and Assistant Engineers' certificates are not fit to be entrusted with any work as Overseers, and care very little to submit to discipline and to learn work. At times some of them prove very obstructive to the progress of the works. I should therefore suggest that all those who pass for Assistant Engineer and obtain the degree of B.C.E. be made to enter the Department as 3rd grade Overseer on one year's probation, and when they are proved to be honest, active, indefatigable and willing, they should be confirmed and allowed equal chance of rising by merit to the highest grade in the upper subordinate class, and those that are resourceful under difficulties, prompt at coming to a decision, thoroughly qualified in almost all the branches of Engineer works that are carried out in the country, and not afraid of assuming responsibility, and, above all, perfectly trustworthy and honest, should be promoted to the Engineers' or officers' class. As Dr. Oppert said, the abilities of the Professors are judged by counting the number of boys that pass every year, so the ability of an officer in the Public Works Department is judged by the amount of money spent by him every year, without caring much to ascertain whether the works for which the money was spent are made substantial and durable or otherwise, as already pointed out by me.

The *President*—contd.

Inexperienced European officers from England should not be put in charge of a division or a subdivision till they have had some experience of practical work.

The Natives are not wealthy enough to go to England, and those that can afford it will not venture to go there for fear of losing their caste; they should therefore be educated and trained in this country and made to enter the Department, as already stated, without any distinction as to caste or creed, military or non-military, and only those of approved service and perfect honesty should be retained in the Department.

We require fully experienced and thoroughly honest men for the executing the public works, and not men with unsound educational attainments and of dishonest character.

I myself was a subdivisional officer in the Public Works Department, and from my experience of 26 years' service, I am proud to state that Royal Engineers are always the best; the covenanted European officers (Engineers) rank next, and all the European officers under whom I served, except one covenanted Executive Engineer and a domiciled European Extra Executive Engineer, were honest and painstaking; but the only drawback with most of them was that they always kept the Natives at a distance. It was therefore impossible for them, however highly efficient and straightforward, to know much of the history of a work.

In conclusion, I desire to add that this country should be kept supplied with experienced and respectable European Engineers until it is able to provide its own; and when young officers with only theoretical knowledge are obtained from England, they should be made to enter the Department as Supervisors to start with.

Have you known many Natives who were educated in the Madras Engineering College?—Yes.

Have you served with them?—With some of them.

How did they work?—I was not satisfied with them. One of them was an Overseer under me, and set a very bad example.

How was that?—He was very disobedient, and, moreover, he was in the habit of submitting bills for double and sometimes treble the quantity of the work done, for which I duly reported him. It happened on two occasions, whether intentionally I cannot say. He could do the work properly if he liked, and whether he failed from carelessness or dishonesty I do not know.

Have you met other men of the same class who did the same thing?—This is the only instance I know of personally, but I am informed that other instances did occur in the same district.

Mr. *White.*

You are an experienced man in the Public Works?—Yes.

Are there in each district important works always going on?—Not always. Ordinary irrigation works are always going on,—that is to say, the

Mr. *White*—contd.

maintenance of, and improvements to, existing works, and sometimes new works when the Government is able to undertake large projects.

These very important works are the exception?—Yes, some of them are styled extraordinary.

You want very high Engineering skill for them?—My opinion is that almost all the Engineering works that are done in this country could be quite as efficiently done by Natives trained in this country as by Engineers trained elsewhere. I know of no works which require greater skill to cope with them than a locally-educated Engineer possesses.

The *President*.

Then why do you want to bring out Engineers from England?—For the sake of the higher moral tone they give and which Native Engineers do not possess at present.

Mr. *White*.

You want high-class Engineers for the sake of their moral qualities?—Yes.

Does not the fact that European officers of the Department are in the habit of holding aloof from their Native colleagues detract from their usefulness to a great extent?—It does.

The *President*.

What have you to say as regards the Accounts Branch?—I say that the Accounts Branch of the Public Works Department should have an Engineer officer at its head, having regard to the fact that he has to deal with so many matters connected with the profession. It is his duty to judge whether the charges on vouchers are proper, and to be able to do so he should have a thorough Engineering knowledge.

Have you personally had anything to do with the Accounts Branch?—I have had to submit accounts.

Through a district officer?—Yes.

Witness No. LXIX.—*15th August 1887.*

Examination of S. Narayanaswami Chetty, Esq., District Court Pleader, Municipal Councillor and District Board Member, Vellore.

S. Narayanaswami Chetty, Esq.

The *President*.

What are the views you wish to lay before us?—I advocate the employment of Natives in the Public Works Department as Supervisors, Sub-Engineers, Assistant Engineers, and Executive Engineers. But for the present I do not think them qualified to be Superintending Engineers or Engineers in charge of special projects requiring extraordinary skill and experience.

The higher grades of the Department should be open to men who have taken an honorary degree and have been trained for that service.

Some who have obtained a degree in Arts as well as Engineering, although very many have failed only by a few numbers in obtaining the appointment in the higher grade, which is annually given by the Government, get at the best only an appointment of Overseer on ₹50 or ₹60 per mensem. Consequently they become discontented and work without heart. They are always looking out for more lucrative employment under Local Fund Boards in Native States, or in the Revenue Department.

The *President*—contd.

It would, in my judgment, be desirable to create a separate service for such graduates which they might enter on higher pay, and from which they might be promoted to the higher grades as vacancies occurred, if they showed themselves deserving.

I am also of opinion that promotion to the higher grade should be open to men of approved merit in the lower grade.

Witness No. LXX.—*15th August 1887.*

Examination of W. D. Calder, Esq., Accountant, first grade, Public Works Department.

W. D. Calder, Esq.

The *President*.

When did you enter the Department?—In April 1874, as Accountant in the fourth grade. I was appointed by the Local Government at Hyderabad. I was born and educated in India.

What is the staff of the Madras Accounts office?—There are four officers in the superior Accounts Branch, one of whom is the Examiner; the other has the rank of an Examiner, but performs the duties of a Deputy Examiner; the third is an Assistant Examiner, and the fourth an apprentice. The Examiner is a Royal Engineer officer, Major Christie; the next officer is Mr. Rainier, a European appointed in India; the third is Mr. Cox, a Cooper's Hill Civil Engineer, transferred from the Engineering Branch; and the other is Mr. Swetenham, an Examiner recently appointed. There are sixty-five members of the clerical establishment.

The *President*—contd.

Is Mr. Swetenham domiciled?—I do not know. Of the fifty-eight Accountants all are Natives of India—statutory as well as Asiatic.

Is there any grade in this Department which corresponds to that of Chief Superintendent in the Financial Department?—There is no rank in this Department that goes by that name.

The clerical establishment has purely clerical duties to perform?—Yes.

How are Accountants appointed?—In the lower grade by examination; in the higher grades up to the fourth grade by the Local Government; those higher still, by the Government of India. They have to pass an entrance test, which comprises arithmetic, handwriting, dictation, and mensuration.

India.

P. W. Department.

Section III.

W. D. Calder, Esq.

The *President*—contd.

Who conducts the examination?—The Principal of the Civil Engineering College.

Have you anything to observe on the constitution of this Department with regard to the superior Accounts Branch which is now composed of Royal Engineers, Cooper's Hill men, and Europeans appointed in India and promoted Accountants?—I wish to say something. The Cooper's Hill men are educated for the Engineering Branch of the service; they come out to India and after a while are transferred to the Accounts Branch, for which they are not required, because, so far as my experience goes, the Accounts Branch does not call for any knowledge of Engineering, and their appointment only takes away from deserving Accountants the appointments which would otherwise have fallen to them. For appointment to the upper grade of the Department there is an examination to be passed, but first there is the nomination by the Accountant General which every candidate must have before he can appear at the examination; though it does not follow that because you pass the examination you get the appointment.

Is it not also laid down that a candidate must not be under eighteen or over twenty-two?—I believe there is some such provision; but what I object to is the rule which requires that every candidate shall have been nominated by the Accountant General.

What system would you substitute for the present one?—I would do away with the necessity for nomination and leave it open to Accountants to present themselves for examination without nomination.

Is there any other point you wish to bring to our notice?—Yes, there is a rule (Chapter 2-61 A II of the Government of India Rules) which limits the promotion of Accountants in the superior accounts to the post of Examiner, fourth class, third grade. The rule is that in the event of an officer appointed to the superior Accounts establishment on account of long and meritorious service as Accountant being subsequently appointed to the rank of Examiner, he must not expect promotion beyond the lowest grade of that rank. The object of the rule is stated to be, to prevent the superior Accounts Branch being increased to an unnecessary extent, but its effect is to prevent meritorious Accountants from rising.

What is the highest salary obtainable by an Accountant?—₹450, but he can get ₹550 after ten years. From ₹350 he gets to ₹450 by five annual increments; after five years, he gets ₹500, and after five years again ₹550. The pay of an Examiner ranges from ₹100 in the lowest grade to ₹1,600, the pay of the highest grade.

Have any of the Accountants received an Engineering training?—One has—Mr. Conquest, who is here to give evidence for himself.

Mr. *White*.

When was the grade of Apprentice Examiner first formed?—In 1880.

Does the Accounts Branch of the Public Works Department require any particular knowledge of Engineering in its officers?—No.

Is it sufficient if you have one Royal Engineer at the head of this branch of the Public Works Department?—I would have a few others, because they help to give the Department a tone. I would not eliminate the Royal Engineers at all. They are better as Examiners also than men who are not Royal Engineers.

Mr. *White*.—contd.

Have you known any instance of a Eurasian or European Native of India having been nominated by the Accountant General?—I was myself appointed in that way, and Mr. Donoghue was nominated at the same time.

Is there anything to prevent Natives of India being appointed in that way?—No.

The *President*.

Are there not a large number of domiciled Europeans in the Examiner's establishment?—Yes.

Mr. *White*.

Are there any Eurasian or Native Examiners or Apprentice Examiners in the Madras office?—By an accident there are none, but there are in the other Presidencies. The Examiners are transferable from one Presidency to another.

When was Mr. Swetenham appointed?—In June 1887.

He is one of the Apprentice Examiners?—Yes; the first one we have had. He is getting ₹100.

Is he considered of a higher rank than the old and meritorious Accountants?—He is in a higher class.

Is he in a position to exercise authority over the others?—He has nothing to do with the exercise of authority. He is at present in charge of a branch and learning his work; all his papers pass through the Examiner's hands.

Who is the head of the subordinate department?—Mr. Gower; he is an Honorary Assistant Examiner, after twenty-one years' service.

He was not paid ₹100 a month to learn his work?—He started as an Accountant in the fourth grade.

Is there any chance of a Native of India being appointed an Apprentice Examiner?—There is no rule to prevent it.

Do you know Mr. Lund?—Yes; he is an Accountant promoted to be Deputy Examiner.

Is he a Native of India?—I do not know.

The *President*.

A good many Accountants have risen to be Deputy Examiners?—Yes.

An Accountant of the first grade when promoted to the superior branch would supersede all Assistant and Apprentice Examiners?—Yes; what I complain of is that by the recent transfer to the superior department of a large number of Cooper's Hill Engineers the opportunities for promoting the Accountants have been greatly diminished.

Mr. *White*.

Are not these Apprentice Examiners a block to promotion?—No; they come in as supernumeraries.

But in course of time when they rise higher in the service they will be a block to promotion?—They will.

Mr. *White*—contd.

The Department could do without them?—Yes.

Do Accountants who have risen to be Examiners get any higher promotion?—Some have done so. One, an apprentice who is at present acting as an Assistant Examiner, is the grandson of a domiciled European of this Presidency. I should say that as a body the Accountants are not sufficiently educated for the upper service.

The *President.*

And therefore you require to have in some men of education?—Yes.

Is R30 to start with insufficient to attract men of education in this Presidency?—Yes.

Have you anything further to add?—Yes. I should like to see it authoritatively stated whether or not the exemption of the Public Works Department from the rule which requires the sanction of the Secretary of State to all appointments to posts carrying salaries of R200 applies to the Accounts Branch also.

Major *Chrystie.*

When you say that service in the Accounts Branch of the Public Works Department does not require any knowledge of Engineering, you are speaking of course as an Accountant?—I was speaking according to my experience of the work in the office.

When you say a certain number of Royal Engineers are necessary to give a "tone" to the Department, do you mean that you think the Royal Engineer officers do their work better?—Decidedly.

You are certain about that?—Perfectly so.

To what do you attribute their superiority?—To their superior general education.

Have you had any means of comparing their work with that of officers who have come out from Cooper's Hill. Have you ever known a Cooper's Hill man, in the grade of Examiners, in independent charge of an office?—I have not worked under one.

Can you fairly compare a Royal Engineer officer of seventeen or eighteen years' service with an officer from Cooper's Hill of six or seven years' service in India? Is it not possible that when Cooper's Hill Engineers rise to the higher grade they will show the same excellence which you notice in Royal Engineers?—Not to such a degree.

Are Cooper's Hill Engineers better or worse in the Accounts Branch than the European Examiners appointed in India?—They are better.

Have any Europeans in India been appointed to the higher grades?—A great number have.

Mr. *White.*

In what way are Cooper's Hill men superior to local Europeans?—In point of general education. They can give a better opinion on questions which come before them.

Have you any experience of Natives of India in the superior grades?—There are some, but I have never worked under any.

Major *Chrystie.*

There is a difference, is there not, between an Accountant who is promoted for long and meritorious service and one who is promoted on account of special qualifications for the work in the superior establishment?—There may be.

That is to say, in one case it may probably be that an Accountant is promoted, not because he is likely to do specially good work in the superior establishment, but simply as a means of rewarding him for long service, whereas in the other case the man is promoted because he has shown in his inferior capacity certain special qualifications which are thought to qualify him for the higher appointment?—I see the distinction, and if the Government maintains it always, I have nothing to complain of.

May it not be that an Accountant who is promoted in reward of long and meritorious service is not fit or is very likely unfit to occupy an important and independent charge?—It may be so.

Do you think that the majority of the Accountants in the inferior establishment are in any way fitted to be ultimately promoted to the superior establishment?—The majority of them are not.

A great majority?—Yes.

Very few are?—Yes.

Or are ever likely to develop the qualities which would make them fit?—They are not sufficiently well educated.

Is it desirable that there should be a superior and a subordinate establishment?—It is absolutely necessary.

And you think that to promote from the subordinate to the superior establishment as a rule would not do at all?—Yes.

When you said we could do without apprentices what did you mean?—That as we did without them before they were appointed we could do without them again.

Was it not formerly the practice to appoint to the Accounts Branch gentlemen who were supposed to possess all the preliminary special qualifications with a view to promoting them after a year or two?—It was frequently done.

After two or three years they were promoted?—Yes.

Not after long and meritorious service?—No. Mr. Donoghue, who was appointed Accountant at the same time as I was, got an appointment in the higher establishment after two or three years.

If the Apprentice class were abolished, how would you supply their place?—By selections made from the Accounts Branch all over India of Accountants possessing special qualifications.

Would it be possible to fill the lower ranks of the superior establishment with an inferior class of officers, provided the more important charges were officered by officers of a superior class and more experience? Do you think that an officer—say of the rank of a first grade Executive or a third class Assistant Engineer—would be a fit person to be appointed to the Accounts Branch so as after a year's training to be of any use?—Not one bit.

India.
P. W. Department.
Section III.
W. D. Calder, Esq.

The *President*.

Is it desirable to bring into the Accounts Branch men who have taken their degrees at the Engineering College here?—No knowledge of Engineering is required in our office at all.

Are not these Apprentice Examiners appointed by the Government of India?—Yes.

Is it not one of the conditions of the Secretary of State's despatch that no such appointments should be made except with the sanction of the Government of India?—Yes.

The *President*—contd.

That is the only condition?—Yes; and these appointments must have been made under authority or they would have been challenged by the Examiners.

Have you anything further to add?—No.

WITNESS No. LXXI.—*15th August 1887.*

J. Conquest, Esq., B.A.

Examination of J. CONQUEST, ESQ., B.A., Accountant, second grade, Public Works Department.

Witness handed in the following note:—

I was educated at Bishop Cotton's School and at the Central College, Bangalore; passed the Public Works Department Overseer's test in December 1867, and the Bachelor of Arts examination of the Madras University in February 1872; entered Government service as Master of the Engineering Class attached to the Central College in September 1872, and was appointed probationary Accountant, 4th grade, in October 1873. I am at present an Accountant, 2nd grade, of four years' standing, and am one of the Superintendents of the Audit Branch of the Public Works Examiner's office at Madras.

I beg to make the following remarks regarding the rules for examination and appointment to the superior Accounts establishment, so far as they militate against the advancement and interests of the Natives of India.

Superior Accounts Establishment.

The nomination of candidates for examination is made by the Accountant General at Calcutta. Such nomination, I think, would be hard to obtain by any one out of the circle of the Accountant General's influence. I think the competition should be an open one, and the best of those who pass selected, preference being given to those in the Department.

The subjects for the examination are also, in my opinion, susceptible of some modification. Hindustani is compulsory. I think, if a Native language is considered absolutely necessary, the candidate ought to be allowed to select the one he is best acquainted with. The candidate is also expected to pass in Latin or French or German. This is very hard on a pure Native, and is almost prohibitive.

I also think that one who is a graduate (M.A. or B.A.) of any University should be exempted from the examination for appointment. The examination for the B.A. degree at Madras is much severer than the test prescribed for the superior Accounts establishment, and ought to exempt a candidate; but the rules contemplate no such exemption.

Assistant Engineers and Executive Engineers who are Europeans are according to the rules and practice of the Department appointed to the superior Accounts establishment. This, I am of opinion, is an evasion of the ruling of the Secretary of State regarding the appointment of Europeans in India on salaries of ₹200 and over. Under this arrangement, a number of Cooper's Hill men, as Engineers, come into the Accounts establishment and thereby waste "the highly specialised and elaborate training" they got in England.

It has been stated that a knowledge of Engineering is useful to an Accounts officer. I do not think it of any use at all. I had a slight knowledge of Engineering when I entered the Accounts Branch and never found it of any use to me. On the other hand, I think a knowledge of accounts would be very useful to an Engineer, as he ought to know how to account, according to the rules in force, for expenditure incurred by him on behalf of Government. I would also here point out that "estimating," which may by some persons be considered useful to an Accounts officer in the Public Works Department, has lately been struck out from the subjects for the superior Accounts test. I do not, therefore, think that Engineers have any special or technical qualifications that entitle them to admission into the superior Accounts establishment.

When they come to us they have to be taught their work, and are not of much use for about a year. These officers also for a time draw more pay, by ₹50 a month, than other civilians of equal rank in the Department.

I also think that the appointment in India of Europeans as Apprentice Examiners is another evasion of the Secretary of State's ruling. An apprentice is appointed on a salary of ₹100 a month, and, when qualified, obtains an Assistant Examinership carrying with it a salary of ₹250.

Accountants may be advanced to the superior establishment after passing the prescribed test (examination for appointment to the superior establishment, Hindustani and Latin or French or German being excepted in their cases), but "*no Accountant, whether he has passed the necessary test or not, has any claim for transfer to the superior grades, but deserving and qualified Accountants may be so transferred under special and exceptional circumstances.*"

The rule quoted above admits of the advancement of Accountants to the superior establishment; but, alas! *deserving* and *qualified* Accountants may be so transferred *only* under *special* and *exceptional circumstances*. What these special and exceptional circumstances may be I cannot imagine, unless the possession of interest.

There are many well-educated, deserving, and qualified Accountants in the subordinate establishment who, if the appointments in the superior grades were not filled up by men hailing from Chatham or Cooper's Hill, could with advantage be promoted, and on the score of common justice to the children of the soil and economy to the State this ought to be done.

The promotion of qualified Accountants, who from their long and practical experience are better suited for appointment to the superior grades than mere outsiders, should be the *rule* and not the *exception*.

There is another rule of recent introduction, affecting promoted Accountants, which I consider invidious, and which in my opinion should be cancelled. It runs thus (Madras Public Works Code, Chapter I, paragraph 135 A) :—

"The following rules are laid down in order to prevent the superior Accounts establishment being increased to an unnecessary extent :—

"I. * * * * * *

"II. In the event of an officer appointed to the superior Accounts establishment on account of long and meritorious service as an Accountant being subsequently promoted to the rank of Examiner, he must not expect promotion beyond the lowest grade of that rank" (Examiner, 4th class, 3rd grade).

How his non-advancement will prevent the superior Account establishment being increased to an unnecessary extent is a riddle I cannot solve. Perhaps its purpose is to stop him complaining when a Royal Engineer is brought into the branch straight off as an Examiner, 4th class, *2nd grade*. He would not have a leg to stand on in complaining of supersession. His attention would be invited to the rule, and he would be told, "*you must not expect promotion beyond* Examiner, 4th class, 3rd grade."

Accountants, 1st grade, may be promoted to *Honorary* Assistant Examiners. "The promotion being purely honorary" (I quote from the Code), "and given solely with the object of improving the *social status* of the recipient," it gives them no increase of pay. How the social status of an Accountant is improved by having the *honorary* rank conferred on him passes my understanding. If it be really desired to improve his *social status*, let a pledge and assurance be given to him that, if found qualified and deserving, his advancement to the superior establishment would be certain. The rank of Honorary Assistant Examiner, which in my opinion is only a sham and a pretension, should be done away with. Accountants, 1st grade, will not care for the empty distinction if the prospect of real and tangible promotion be held out to them.

Subordinate Account Establishment.

Comparatively there is not much to speak of regarding the rules regulating the appointment and promotion of the subordinate Account establishment.

In Madras first appointments are made to the fifth grade. This grade has no existence in other parts of India, and is not recognised in the Government of India classified list. The pay of an Accountant, 5th grade, on probation, ₹30, does not attract the best men. In Bengal and elsewhere, first appointments are to the 4th grade, on probation, salary ₹60.

In the subordinate grades of the Accounts Branch there is nearly always a block in promotion. This would, in a great measure, be ameliorated if Accountants were freely promoted to the superior establishment and also if the number of Accountants, 1st and 2nd grades (who have the relative rank of Sub-Engineers), were fixed at three-sixteenths of the total number of Accountants in the same manner as the number of Sub-Engineers is fixed at three-sixteenths of the total number of upper subordinates. The number of Accountants, 1st and 2nd grades, is now fixed at one-eighth. Some years ago the number of Sub-Engineers was also fixed at one-eighth, but owing to a block in promotion the fraction was increased to three-sixteenths.

The *President*.

What was the object of the condition which requires that a candidate for the superior accounts service must pass in Latin, French, or German; was it not intended to secure that the candidate has had a liberal education?—A Native of India has no opportunity of learning those languages.

Is it desirable that there should be a superior and subordinate account service?—I think so.

And would you not require better educational qualifications for the superior than for the subordinate service?—Certainly.

You say a knowledge of accounts is very necessary to an Engineer; how should he obtain that knowledge? Have you considered whether it is desirable to allow all Engineer officers who are to have separate charges to pass a certain period of time in the Accounts Branch?—I think that would only interfere very much with the work of the Department, and besides they would only get a practical training.

What is your opinion as to the fitness as a body of gentlemen in the Accounts establishment to be promoted to the superior rank?—That they are not fit as a body.

You would have to make selections?—Yes.

What do you think would be the best way of recruiting the superior grades?—I would have promotion from the Accounts establishment as well as direct appointments of outsiders. The latter would have to pass a qualifying examination and would receive their first appointment as probationers.

What is the pay of a fifth grade Accountant in Madras?—₹40. Those in the fourth grade get ₹80.

How long generally do men remain probationers?—About a year.

How long does it take a man to become, from Deputy Examiner, second grade, an Examiner of the fourth class, third grade?—Six or seven years on an average.

Mr. *White*.

Is there a feeling among the Accountants that they have no hope of rising to the Examiner establishment?—That is the general feeling among them.

That is, of those who are Natives of India?—I know there is a strong prejudice against Eurasians. The majority of the Examiners who have been promoted are Europeans.

Do you mean that there is a prejudice against promoting Eurasians to the superior establishment?—Yes.

You would like to have these appointments made regardless of nationality?—Yes.

Do you think that by opening these superior grades freely to Natives of India a better class of men would be encouraged to enter the Accounts Branch?—Yes.

India.

P. W. Department.

Section III.

J. Conquest, Esq., B.A.

Major *Chrystie.*

When you said there is a general prejudice against promoting Eurasians, had you any actual facts in your mind which would justify you in saying so, or were you merely giving utterance to a general impression?—It is a general impression.

Do you know of any facts that would warrant that impression?—No, except the social disabilities under which Eurasians lie.

Can you tell me how it happens that there are so few Natives in the upper grades of the Accounts establishments as compared with the large number of Europeans and Eurasians in those grades?—I believe the reason to be the examination which they have to pass before they can be appointed to the first and second grades.

Do not Natives go up for this examination?—Yes; but in this Presidency comparatively few pass it.

The *President.*

Do Mahomedans ever seek admission to the Accounts Branch? No.

Mr. *White.*

Do you know if any Eurasian has applied for a nomination as Apprentice Examiner?—I only know of one who has.

Did he get a nomination?—Yes.

Major *Chrystie.*

Do you think that Europeans and Eurasians do their work better as a rule than Natives?—That is my experience. A Native will stick to his work longer, but he is very slow.

Does he require more teaching?—Yes; of course there are exceptions.

Might not that also to some extent account for the larger proportion of Europeans and Eurasians in the higher Accounts establishment?—Yes.

The *President.*

Is it seniority or selection that rules the promotion to the upper grades of the Accounts establishment of persons who have passed the examination?—Seniority. Very few promotions from the third to the second grade Accountants have occurred to my knowledge.

Major *Chrystie.*

In the cases within your knowledge, has there been any room for selection?—No, because there was only one qualified candidate.

WITNESS No. LXXII.—*15th August 1887.*

B. Narasinga Rao, Esq.

Examination of B. NARASINGA RAO, ESQ., Accountant, fourth grade.

The *President.*

When did you enter the Accounts Branch?—In 1877, as probationer in the fifth grade of Accountants.

How is it you are only in the fourth grade now?—I have not passed the examination so as to entitle myself to promotion, and consequently my promotion is barred by my seniors in the grade. If I had passed the examination, I might have been promoted at once. I intend to present myself at this year's examination.

What have you got to tell us that concerns the present enquiry?—I wish to say that the officers at the head of the larger provincial offices like Madras, Bombay, and Calcutta should be Royal Engineers, but that the smaller offices may be managed by officers other than Royal Engineers. I also wish to say that the practice of transferring Cooper's Hill Engineers from the Executive to the Accounts Branch ought to be discontinued as prejudicial to the just aspirations of Accountants.

Is it necessary to have a subordinate and a superior Accounts service?—Yes.

Why?—Because it gives us a better class of men for the superior service.

Would you also promote from the Accounts establishment to the superior service?—Yes, deserving Accountants.

Have you taken a degree?—No; I am a matriculate only.

How is it that apparently so few educated

The *President*—contd.

Natives seek admission to the Accounts Department?—It is only since 1880 that the graded system has been in force in the Madras Presidency. Prior to that date Accountants were not required to pass any examination, except perhaps the general test of handwriting and arithmetic examination corresponding to the middle school test, and there are still many of the old stamp in the Department. Within the last two years book-keeping and mensuration have been added to the subjects of examination. Another reason is that graduates in Southern India do not, as a rule, write a good hand, not having been trained to it in their college course, and so they not unnaturally fail in the examination; while others do not present themselves for it, having no hope of succeeding. Moreover, the pay of ₹30 for a probationer and ₹40 for a fifth grade Accountant on confirmation is insufficient to attract good graduates to the Department. There are two B.As. now in the fifth grade, and a third has been transferred to the State Railway Accounts. I wish also to bring to your notice that owing to the proportions in the several grades not being properly adjusted, promotion is very slow in the upper Accounts establishment of this Department, and that if the proportions of higher appointments were adjusted on the same principle as that of the upper subordinates, there would not be this block in promotion.

Major *Chrystie.*

The work of Accountants in the two higher grades of the Accounts establishment differs

Major *Chrystie*—contd.

altogether from that of Accountants in the lower grade?—Yes.

Is it not necessary that the proportions should be adjusted according to the number required for those duties?—Yes.

It is not possible to adjust the proportion simply with a view to rapidity of promotion?—No.

Mr. *White*.

The work of the Accounts Department is such that any man of ordinary education can cope with it?—Yes.

You wish to see a Royal Engineer at the head of each of the larger Presidency offices because of the weight and position he carries?—Yes, and because of his having to deal with the heads of other departments.

Mr. *White*—contd.

But in other respects you think that any intelligent man of good experience and ordinary education could perform the duties of those offices equally well?—Yes.

Major *Chrystie*.

How are you qualified to form an opinion as to what qualifications are necessary for work you have never done or attempted to do?—I only judge from seeing other people doing it.

The *President*.

Have you any other point which you want to lay before us?—No.

India.

P. W. Department.

Section IV.

Babu K. Sen.

INDIA.

Public Works Department.

Section IV.—Written Evidence.

No. I.—Babu Kedarnath Sen, Sub-Engineer, 3rd grade, Bengal.

I have the honour to represent the following facts concerning the Public Works Department and its accounts for your consideration in the drawing up of the Report regarding the same.

If the Government of India is really disposed to curtail expenditure, this Department is the best field where the scissors can be well applied.

There are more Engineers on the roll than the actual work requires, and there is the probability of getting more every year from the Cooper's Hill College. This College is an excrescence as it were on the Indian expenditure.

The pay of the Engineers has been unduly increased of late to the advantage of the Cooper's Hill men. Cooper's Hill men are as a rule appointed in a higher grade. Their Pension and Furlough Rules are more favourable than those of other Engineers; but, notwithstanding all this, these Engineers have very little to complain of when their lot is compared with that of the subordinates of the Department. The pay of the former has been thrice revised and increased during the last 20 years; the number of Engineers in the higher grade has been increased to allow room for promotion of the lower-grade men, and thus their promotion has been made easier.

The subordinates, who are as well trained as the Engineers, have none of these advantages. No one ever agitated for the amelioration of their lot, and have even been allowed to do so. Thus nothing tangible has been done towards the amelioration of their pay and promotion during the last 20 years. Men in these subordinate grades have been working in the same grade for so much as 10 to 15 years. Some attempts have been made of late to redeem this shortcoming by giving increments to 1st grade Sub-Engineers of more than five years' standing. Now it may be asked what have the 2nd and 3rd grade Sub-Engineers done to disentitle them to receive this boon?

The Furlough and Pension Rules of these subordinates are not less hard. The Engineers, especially the Cooper Hill ones, have the option of retiring after 15 years' service; their furloughs are allowed to count as service. Why has not this boon been extended to the subordinates as well? These subordinates of the Department work in the sun and rain, while their fortunate superiors, the Engineers, work in the cool air under punkah. It is the *fervent* prayer of the subordinates that the Committee will recommend some remedy for these their grievances.

P. N. Bose, Esq.

No. II.—P. N. Bose, Esq.

I do not see the necessity of keeping up the Cooper's Hill College. A very limited number of Engineers (much smaller than the present number) may be got by competition from Europe; but the maintenance of a special training institution for them does not appear to be at all necessary.

The Indian Engineering Colleges, especially the Rurki College, are fully capable of meeting at least all our ordinary demands. The number of appointments at present guaranteed to them is too small. Only one Assistant Engineership is, I believe, secured to the College at Seebpore.

T. D. Little, Esq.

No. III.—T. D. Little, Esq., C.E., Executive Engineer, Khandesh.

1. The first question regarding which I am called on to give my views is that quoted in margin, and in dealing with the technical requirements I propose to confine myself mainly to the duties which fall to the lot of an Executive Engineer holding an ordinary district charge. There are special charges connected with fortifications and large military stations, and also with railways, which have technical requirements of their own, and the same may be said in regard to harbour and dock works. This, too, is the case in respect to certain important operations in Hydraulic and Sanitary Engineering, though there are many works connected with Drainage and Water-Supply which form a portion of the ordinary duties of the District Engineer. My views in regard to the requirements of ordinary district charges—which form a numerically strong and very important Public Works Department element—are founded on an actual working experience of more than 25 years as an Assistant and Executive Engineer, but in regard to the operations of special branches my opinion would not be based on the same foundation of practice and experience. And I therefore propose to confine myself chiefly to the consideration of the professional duties and wants of the ordinary District Public Works Department Establishment.

The technical requirements of the Department and the professional attainments essential for efficient service in its various branches.

2. The technical requirements in connection with ordinary District operations are not always of a very scientific character, but the duties are multifarious and require a considerable amount of practical experience and a capacity for managing and organizing labour. Executive Engineers and their estab-

lishments have not only to perform the functions of engineers and architects, but have likewise to be builders, clerks of works, and often brick-makers, lime-burners, woodcutters, &c., and in my own practice I have frequently had not only to make the whole of my materials, such as bricks, lime, tiles, &c., but have also had to arrange for felling trees and turning them into bridges, roofs, doors, windows and other things. In the Bombay Presidency, all roads and buildings (civil and military) are as a rule designed, executed, and kept up by the Public Works Department Executive Engineers. Wells, tanks, and other projects of water-supply, drainage, &c., are also included in the duties of the office, and District Engineers act as County and Highway Surveyors and are the professional advisers of all Local and Municipal Boards and Bodies, and of all civil and military officers within their charges.

3. The various portions of the duties alluded to are performed by—

(1) The Lower Subordinate Establishment,

(2) The Upper Subordinate Establishment,

(3) The Engineer Establishment; and these I propose to deal with in the order named.

Lower Subordinate Establishment.

4. Originally, lower subordinates were mainly of the maistri class, and were usually leaders and skilful workmen in their respective handicrafts. Since the early days of the Department there have been many changes and developments in regard to these subordinates, and the Sub-Overseer is now frequently a Hindu (of a caste superior to the artisan) who has acquired at the Poona College of Science a small amount of technical knowledge coupled with a little training in the College workshop. Sub-Overseers were formerly employed as foremen over building operations or particular branches of building, but now they are usually placed in general charge of single important works, or more frequently they have a number of small works and repairs in a certain area which may extend to a few square miles or to a few hundred. The Sub-Overseer, in fact, does now pretty much what the Overseer did a few years ago, and the old class of maistries have had to make way for men who not only superintend the preparation of materials and the execution of work, but who can also survey a little, take a few levels if required, and make calculations and draw simple plans. In my opinion, the change in training was necessary for the new duties, and I would gradually raise the educational standard and also the numerical strength of the lower subordinate establishment, and I would endeavour to secure as candidates men who had qualified as upper subordinates but who were not high enough in the list to obtain appointments. In former days the supply of men for official work was much smaller than at present, and it is possible now to get better-trained subordinates at a much cheaper rate than formerly, and advantage should be taken of this in order to recruit for the public service on more economical terms. I do not think the amount of workshop training that can be given in an educational establishment is likely to be of much practical use to a Sub-Overseer engaged on general duties. A really good workman with a store of general and technical knowledge would be valuable, but Sub-Overseers who are not handicraftsmen by descent but who have picked up a little workshop knowledge at College do not as a rule find it of much practical use, while the little theoretical training they possess is constantly in demand. I do not undervalue the advantages of training in a good workshop or mechanical laboratory for certain careers, but few men can perform double functions satisfactorily, and I would rather an Overseer or clerk of works should be able to calculate the strength of a joint than that he should be able to make one. I would recommend that the examination for lower subordinates should gradually be brought up to the present standard for upper subordinates, and I would appoint more Sub-Overseers and would use them as Overseers in charge of talukas and small districts, and I would give them a charge allowance and would promote specially qualified men amongst them early in their service to the upper subordinate ranks. I would likewise allow selected lower subordinates to be used as disbursers, and reasonable security might be taken from them with a view to this.

Upper Subordinate Establishment.

5. Upper subordinates are in charge either of single large operations, or of subdivisions, or portions of subdivisions. It is necessary that they should understand how to prepare materials and be able to frame designs and estimates for works of an ordinary character. They should likewise possess intelligence and resources of a practical nature, for they are often in charge of outlying operations which can only be visited occasionally by a supervising officer. Their duty further includes advice to Local Boards, and they have to prepare surveys and data for projects and to give their opinions to civil officers in regard to local Engineering matters. The great majority of these subordinates now enter the service through the Poona College of Science, and many of those lately admitted have obtained the L.C.E. degree. The theoretical knowledge which the College examination secures is, in my opinion, equal to the requirements, but I think more time might with advantage be given to the use and preparation of materials and to designing and estimating. But on the whole I look on our upper subordinate establishment as decidedly good, and I am convinced that we have a large number of men who are intelligent and efficient, and who take an interest in their works and manage to secure satisfactory results for their expenditure. I think, however, that upper subordinates are often wasted on duties which might be equally well performed by Sub-Overseers, and I should be inclined to gradually reduce their numbers and raise their position by increasing the proportion of higher-grade appointments. I would also occasionally promote from the upper subordinate to the Engineer establishment men who have proved themselves theoretically and practically competent, and I would prefer to give these promotions to subordinates of from 5 to 10 years' service rather than to older men who would start too late to be able to rise to the more responsible positions in the Engineer establishment. For military stations the requirements are of a special character, and I think it would be well to have an entirely separate list for military subordinates. The life of a Public Works Department subordinate is very hard and trying, and a great deal of physical strength and endurance is necessary, and I think it

India.
P. W. Department.
Section IV.
T. D. Little, Esq.

advisable that only those men should be confirmed who possess the necessary physique and energy. The occasional grant of personal titles on retirement to men of good and approved service would be appreciated.

Engineer Establishment.

6. The technical and professional requirements for members of the Engineer establishment embrace a knowledge of surveying and levelling, facility in preparing designs, estimates and specifications for roads, buildings, and all the various public works from time to time required in a district; also a knowledge of materials and construction, and capacity, professional experience, and energy sufficient for the general conduct of the various official matters with which the Public Works Department is called on to deal.

As advisers to Local and Municipal Boards the Executive Engineer requires a good knowledge of his district and its conditions and resources, and he must be able to supervise the organization of all works in his charge. The Cooper's Hill course, and also that of the Indian Engineering Colleges, I believe to be sufficient in respect to mathematics. For professional success a certain starting-point of mathematical and scientific knowledge is requisite, and I do not think Assistant Engineers in the Public Works Department are as a rule wanting in this respect, but in most cases they start their Indian careers with very little beyond theory, and their practical knowledge has all to be picked up on Indian works, and these do not always provide good training. It is difficult to remedy this, but I think it might be done in the case of Cooper's Hill students by an increase in the time devoted to designing and estimating, and it would be an advantage if the period spent on works could be extended. As regards the L.C.Es. appointed in India there is the same difficulty, and it is often still more pronounced, and I consider that more preliminary training is required in designing, estimating, &c. Executive Engineers have too much to do to be able to devote time to the education of assistants, and men have to pick up what they can and how they can.

7. In the above paras. I have considered technical requirements and professional attainments together, for it is difficult to separate them, and I will now touch on the second question regarding which my views are called for and which is here quoted.*

* The classes of the community who seek to be employed in the Department, and the comparative capacity of each for rendering efficient service therein.

Lower Subordinate Establishment.

8. For the lower subordinate appointments the applicants are mainly Hindus. Formerly, as mentioned in my paragraph 5, most of the Sub-Overseers were artisans by caste, but these have given place to a considerable extent to men of the more literate classes, and it seems to me that this result was inevitable from the change in the duties and qualifications. I consider that the lower subordinate establishment should be recruited, as at present, from men trained at the Poona College of Science, supplemented occasionally by qualified men from the temporary establishment who have proved their capacity by good work.

Upper Subordinate Establishment.

9. The upper subordinate establishment is also mainly recruited from students trained in the Poona College, and, as mentioned in my paragraph 6, I consider that we obtain good men, though I would increase the training in professional subjects. The College is open to Europeans as well as to Natives of India, but the bulk of the appointments are secured by Hindus of the higher castes. I do not think that appointments in the upper subordinate establishment are suitable for European civilians, for the pay in the junior grades is too small for comfort. I am sorry this is the case, for I consider that Europeans and Eurasians also may be useful in certain positions. I should be glad to see more Mahomedans and Parsis in this branch of the Department, but I would not change the method of appointment. In military works warrant and non-commissioned officers of the Royal Engineers are usefully employed, and they are of use also at times on civil operations, particularly on large works near stations, but I do not think they are suited to ordinary district subdivisions. Subordinates are advisers of Taluka Local Boards, and are often consulted by Native officials and others in regard to local matters; and for work of this class I prefer Native subordinates, though I have come across Europeans (both civil and military) who managed district subdivisions with tact and ability.

Engineer Establishment.

10. The recruiting sources for the Engineer Establishment of this Presidency are—

(1) The Corps of Royal Engineers,

(2) The Royal Indian Engineering College, Cooper's Hill,

(3) The Poona College of Science; and the various classes of the community who seek employment in this branch of the Department must now enter it through one of these sources.

11. The Royal Engineer should have certain advantages in dealing with military stations and military works, while as regards civil operations I do not think there is much to choose between those Royal Engineers who accept permanent employment in the Public Works Department and Civil Engineers who do the same. In the old days of the Indian Corps of Engineers, military members often spent the greater portion of their lives in the Department, but now comparatively few Royal Engineers do this, and officers who merely accept temporary employment in India are not able to obtain the experience which is accumulated by those who are permanently employed on Indian works, and there is no country where experience is so much needed and so valuable.

12. I think it would be well to have a sprinkling of Civil Engineers who have entered the profession through the ordinary channel of pupilage, and who have been trained on works under Civil Engineers; for though men so educated might have less theoretical knowledge, their practical training would be useful, and an infusion of such candidates would do good.

13. In regard to Native candidates there is doubtless much difference of opinion, and I think it is yet too early to fairly estimate the value of Natives as Civil Engineers. I can testify from

personal experience that Natives of India can do excellent service on the Engineering staff of the Department, but I am also aware that some Native Assistants are wanting in energy and in practical professional knowledge, and also in that tact and judgment so essential to successful administration. Very many Native students who are able to pass a test mainly theoretical do not possess the physique and energy necessary for success as Civil Engineers, and it is most desirable that such men should be excluded, and that the selected Native Assistant should be the best available. My own opinion is in favour of promotions from the upper subordinate establishment, and I would make these by examination from amongst candidates qualified theoretically and practically, and I believe this would lead many good men to enter the subordinate establishment. These promotions I would make from men between 5 and 10 years' service, and this would secure a sufficient practical training, while the Assistants selected would not be too old to rise to prominent positions in the Department. It is very desirable in the interests of all concerned that the Native members of the Engineer establishment should be the very best men obtainable, for otherwise the system of employing Natives in the higher grades may be handicapped and discredited.

14. In conclusion, I must apologise for the somewhat discursive character of this report. I have found it difficult to deal with the questions concisely, and the consideration of such subjects as the technical requirements and professional attainments and the personnel of the Department necessitated a lengthy reply.

Though the question of cost of establishment has not been referred to me, cost is such a controlling factor that I wish to point out that my suggestions would tend towards economy by improving and extending the use of the cheaper kind of supervising labour and by increasing the efficiency and reducing the numerical strength of the more expensive description. The Public Works Department establishment charges must always appear abnormally heavy when they reach the public in the shape of a percentage calculated only on works actually carried out, for this ignores the large number of projects which are never executed, and it takes no account of the time devoted to consultative and other duties. Even allowing for these extras, the charges must still be considerable, for they include not only the control of the Engineer or Architect, but also in many cases the detailed supervision of manufactures. In general practice most of these charges would be included in the contract cost of works, but in the Public Works Department the work is frequently relieved at the expense of establishment. I do not object to this, and on the contrary I think it may often be good economy to expend four annas out of every rupee on efficient supervision, but in judging of establishment percentages these matters should receive consideration.

No. IV.—George Lambert, Esq., C.E., Superintending Engineer for Irrigation in Sind. *Geo. Lambert, Esq.*

I have the honour to acknowledge the receipt of your * Circular No. $\frac{P}{18}$, dated the 8th instant, calling (1) for my views on the technical requirements and the professional attainments necessary for efficient service in the Public Works Department, (2) the classes of the community who seek to be employed in the Department, and to compare these classes according to my actual knowledge of their capacity for the service.

2. The questions, as they are put, cover a very extensive field when the enormous requirements of this country are taken into contemplation; and after a good deal of reflection, I consider that question No. 1 should be answered at length, and with as much information as I can bring to bear on the subject generally, and that I should not confine my views to the requirements of this immediate district alone, as I had at first intended to do. On the other hand, I consider question No. 2 to apply only locally and chiefly to Natives and their classes, and the attainments necessary for them to become useful servants in the lower grades of the Department; for, as a matter of course, the attainments necessary for officers in the higher grades should be exactly the same, no matter what country or class of the community they may be drawn from.

3. I hope I am not travelling too far back, in commencing to trace the attainments required by a successful Engineer, to the school-days of the boy destined for that profession. It seems to me at least convenient to do so, to allow of a starting-point, to enable me to methodically lay down what I consider the course to pursue, and subjects to study which eventually leads the young student to sufficient knowledge to be employed on some work; and henceforth to consider himself an Engineer by profession. The selection of a good preparatory school, where there are special classes for preparing boys to become Engineers, is a very requisite point to keep in view in the early training of an Engineer; and a school where good general instruction, besides the special education and preparation for technical knowledge is given, is essential. The boy at the age of 15 or 16 having been grounded in mathematics and especially in arithmethic, and perhaps having shown some knowledge of mechanics, should be sent to such an institution as the Royal College, Cooper's Hill, the Engineering School, Trinity College, Dublin, or to any of the great colleges at home or abroad, where special classes are taught in Engineering and where he might study for two or three years. During those years Mathematics, Natural Philosophy, Chemistry, Mineralogy, Geology, strength of materials, Mechanical Motions, the principles of Hydraulics, Surveying, Levelling, and Drawing should be thoroughly mastered. To the above the student should add the study of pure mathematics and classics when time would permit; not forgetting how much also is to be gained by mastering such living languages as French and German, in which many of our best Engineering works are to be found.

* Bombay Government.

4. The youth at the age of eighteen or nineteen, having thoroughly learned the theory required as a ground work to the practical knowledge of Engineering, should, if possible, be placed for a year at least in a mechanical workshop, or in some manufacturing works, where he would acquire technical knowledge. After that he should be transferred to the office of a Civil Engineer in good practice, for two years, where he would acquire method, learn how to design works, make estimates and specifications, and fully understand the necessity of adapting his designs, with economy and usefulness, to the commercial wants of the day.

5. The general knowledge which should be acquired by the young Engineer once he has entered on his practical training in a Civil Engineer's office, has been described by an eminent Engineer as appalling, and indeed when the various subjects which come under the head of Engineering are enumerated it does appear so. As the young Engineer never can know what he may first be called upon to turn his hand to, he is bound to embrace in his studies, Railways, Roads, Canals, training of rivers, Water-supply, Gas-works, Sewerage, Drainage, Irrigation and reclamation, Harbour works, Docks, Piers of various kinds, and Hydraulic Engineering; he should, if possible, have a knowledge of mines, mineral engineering and quarries, of ironwork and carpentry, some knowledge of the steam engine, machinery in general, ship-building and mechanical engineering. He should pay great attention to acquiring a thorough knowledge of selecting materials, how to select good stone according to the character of the work it is required for, and also to know good bricks from bad ones. A knowledge of lime, and the best practical mode of making good mortar from each description of it, deserves the greatest care and study; for to secure good mortar is a continual anxiety to a good Engineer.

6. Although the synopsis of Engineering acquirements I have given includes a large variety of subjects, and still might be indefinitely extended, there is really nothing in it which need appall the young Engineer who possesses energy and perseverance. After the student has passed through the training I have delineated, and proceeds to India or elsewhere to practise his profession, he will still have much to learn; and at this stage of his career it ought to be the practice to select the branch of Engineering he shows most aptitude and desire for, whether it be harbour works, docks, irrigation, or railways. If he comes to India in Government employment, he should be placed under an experienced Engineer in the branch which he intends to follow, who is known to be able to impart his own knowledge, and who is willing to do so; and who will give his young Assistant work to do from which he can learn and advance himself in his profession. It is not all Engineers, although able men, who can instruct or care to instruct young men placed under them, and it happens sometimes that a promising hardworking young Engineer loses his energy and becomes disgusted with his profession from being put to mere office drudgery, or to work below his capacity, which might be more economically supervised by a man in a subordinate position. The sooner a young Engineer has responsible work thrown on his shoulders, and the quicker he learns that personal responsibility is required from him, the sooner he becomes a useful servant to his employer.

7. My knowledge of the classes of the community from which Engineers or subordinates for the Public Works Department are drawn is entirely confined to Sind. The greatest number seeking employment come from the Hindu Amil class. A few candidates are Musalmans, and a still fewer Parsis. I have also had under me a few Brahmins from the Deccan, and one Goanese Christian.

8. I have had some experience of one Assistant Engineer of the Amil class who received his education at the Poona Engineering College, but I cannot say that I was ever favourably impressed by his knowledge or powers as an Engineer; in fact, he was not one bit more intelligent, better taught, or better trained than the ordinary subordinate turned out from the Hydrabad (Sind) Engineering School. I also knew something of the acquirements of an Assistant Engineer, a Brahmin from the Deccan, who also was educated at Poona College. He seemed to have a better theoretical knowledge than the other man, but his practical knowledge was very poor indeed. It was evident that neither of these men had any technical training whatever, and even if they had been exceptionally clever men, it would have been hard for them to have acquired much advanced Engineering knowledge, owing to the class of work they were always employed on.

9. There is no doubt that the Amil of all classes in Sind show the greatest power of acquiring theoretical knowledge, and of applying it successfully to practical Engineering. I have no hesitation in saying that had some of the Amil subordinates gone through the full course of Engineering training at Rurki or Cooper's Hill College with the advantage of practical training afterwards, on large and important works, they would have turned out quite equal to and as successful Engineers as the average run of men in the Department. None of the Deccan Brahmans who came under my knowledge were at all equal to the best of the Amils from the Hydrabad Engineering school.

10. The Musalmans acquired mathematical knowledge with much more difficulty than the Hindus, and the few Musalmans who have successfully passed out of the Hydrabad school into the Department generally come very low on the list, if not at the bottom. I cannot remember a single Musalman who after passing into the service became particularly prominent in practical work, not even as a draftsman; and this, too, with a very general wish on the part of the officers in the Department to help and assist them.

11. The Parsis are generally very dull in acquiring theoretical knowledge, and those who have passed out of the Hydrabad school have been very low down; and although nearly always hardworking and very trustworthy men, they never showed any ability in acquiring practical Engineering knowledge. The one Goanese subordinate of whom I had experience was a very superior man in his position, and I am sure if he had had a better general education and a good practical training he would have made an excellent Assistant Engineer.

No. V.—J. E. WHITING, ESQ., Executive Engineer, Nira Canal, Acting Chief Engineer for Irrigation and Superintending Engineer for Central Division.

In accordance with Circular Memo. No. $\frac{P}{18}$, dated 8th instant, the Acting Chief Engineer for Irrigation and Superintending Engineer, Central Division, has the honour to state his views as to—

(3) (*a*) The technical requirements of the Department, and (*b*) the professional attainments essential for efficient service in its various branches. He considers that (*a*) Engineer officers require full theoretical knowledge of mensuration and of surveying in all its branches, mathematics as applied to mechanics, hydraulics and machinery, also the theory of accounts. The more they know of chemistry, mineralogy and of natural sciences the better. (*b*) The professional attainments which Engineers should have are to be able to draw neatly and correctly and to judge of first-class mechanical drawing. They must know the practical details of Civil Engineering and be able to judge of good work and of materials of construction, to make and to check measurements and surveys, to frame estimates and to design works in accordance with given requirements.

They must know what men, animals, and machinery can be fairly expected to do. They must acquire, by practical tuition, facility and judgment in applying their general knowledge of principles to special Engineering cases, and to the making, interpretation, and use of Engineering formulæ. They should possess insight into character and skill in organizing, utilizing, and managing men, as well as the power of inspiring confidence by their high tone and force of character. An Engineer should have a natural taste for construction, and the more manual skill an Engineer has acquired the better; but it is more important that he should be able to teach and guide and judge of the work of subordinates and work-people.

(4) The classes of the community that seek to be employed in the Public Works Department, of whom the undersigned has had experience, are—

1st.—Students of the Royal Indian Engineering College at Cooper's Hill.

2nd.—Royal Engineers.

3rd.—Those who have obtained the degree of Licentiate of Civil Engineering at the University of Bombay.

Regarding these, the experience of the undersigned places the capacity of these classes for rendering efficient service in Civil Engineering works in the order given above, namely:—

1st.—Cooper's Hill men.

2nd.—Royal Engineers.

3rd.—L.C.Es.

No. VI.—COLONEL C. A. GOODFELLOW, R.E., Superintending Engineer, Southern Division, Belgaum.

Col. C. A. Goodfellow, R.E.

Referring to Government Circular Memo. No. $\frac{P}{18}$ of the 8th July 1887, I have the honour to offer remarks as follows:—

2. Opinion is invited by item (3) of the memo. as to "the technical requirements of the Department and the professional attainments essential for efficient service in its various branches." This question thus put is so vague and so obviously susceptible of a reply of such an enormous size, that very reasonable objection might be taken to being called upon to reply to it, as put; it practically places the burden of conceiving the queries as well as of finding replies to them on the person questioned, and if a full reply were attempted to be made to it, the result would probably be found not to bear very much on the object the questioners had in view. It is also not clear whether all grades—Engineering, upper and lower subordinate and office—of all the branches of the Department—Military, Railway, Irrigation, General and Accounts—are referred to, or only such as the Native community in India is concerned with; if it is only this last, and that with reference to the Engineering and upper and lower subordinate establishments, then I would state my views as under.

3. It is, it seems to me, a mistake to recruit the establishment in the manner now followed; the same education is given, I understand, at the College of Science, Poona, to all who compete for Government employ in the Public Works Department, whether in the Engineering or upper subordinate grades. Of several young men competing, one only at the periodical examinations enters the Engineering establishment; of those who come next a certain number enter the upper subordinate establishment: this is, in my opinion, wrong; the higher technical and professional education should be required to be undergone by the Engineering establishment only; the upper subordinates are not the better, but otherwise, for the smattering of science they have acquired in their college course, and which they soon forget as not required by and of no use to them in their future calling, and they are disappointed and discontented men all their service. An L.C.E. is out of place as Overseer. The education of this class should, after a certain point, be different to, and separate from, that of the future Engineering staff. I do not, of course, by these remarks mean to object to the higher education for as many as choose to undergo it, and who think it will pay them and *who can pay for it*, but only to the failures, or next best in competitive examinations for the Engineering staff of the Public Works Department, being given appointments in the upper subordinate staff. These should try for the employment they have been educated for, elsewhere, and not be given Government posts that would be better filled by others. No amount of technical

India.
P. W. Department.
Section IV.
Col. C. A. Goodfellow, R.E.

and professional knowledge is too much for the Engineering grades, but such attainments are not required for Overseers,—that is, clerks of works; for these a sound knowledge of, and some personal skill in, some handicrafts, of mechanical engineering, of surveying in all its branches, and of arithmetic and mensuration, &c. (but no chemistry or any of the ologies) is sufficient; in fact, a similar distinction to that made between the upper and lower subordinate grades as regards education should be observed between the Engineering and upper subordinate grades.

4. As to item (4) of the Government Memo. under reply, "The classes of the community who seek to be employed in the Department and the comparative capacity of each for rendering efficient service therein," full information regarding the first part of this question is available from the records of the College of Science,—that is, the classes who *seek* employment in the Public Works Department; the lists of the Public Works Department Establishment show what classes *find* employment in it. As to the last part of item (4) opinion of the comparative capacity of the different classes based on experience of the value of their services, this is a difficult question to answer offhand; only study of a record carefully kept for a lifetime with a view to determine the point would enable anyone to give a reliable opinion. Taking the present list of upper subordinates in this Presidency (there is no list published of the lower subordinates), the "classes" it is composed of are as under:—

European & Eurasian.	Military	35
	Civilian	21
Hindus.	Brahmans (including Purbhus and Shenvis)	98
	Gujratis (Banyas, &c.)	29
	Sindhis	11
	Lingayats	1
	Marathas	10
Parsis		12
Mahomedans		4
Jews		2

Speaking from mere recollection unassisted by any kept record, I should say that suitability for service in the Public Works Department was not confined to any class; I have come across good, bad, and indifferent specimens, and the suitability or otherwise was in each case rather personal than peculiar to the class. From the above list of "classes" it will be seen that Brahmans preponderate; this is doubtless owing to the intellectual superiority of this class, of which there is not room for doubt, in this part of India at least; still I do not think it is desirable that any one class should so preponderate, though, if competitive examination is to continue to be the test for employment in Government service, this class will continue to maintain its position for some time yet.

C. T. Burke, Esq.

No. VII.—C. T. Burke, Esq., B.E., M.I.C.E., Executive Engineer for Irrigation, Poona Division.

Question No. 3.—In considering the technical requirements of the Public Works Department, it will perhaps be convenient to detail the various classes or kinds of work in which the Engineer is usually employed in this Presidency.

2. The Department is divided chiefly into two executive branches, *viz.*:—

The Irrigation Branch.
The General Branch.

3. Irrigation officers are usually employed in the preparation of projects for, as well as the design and complete construction of, the following classes of works:—

(*a*) Storage reservoirs.
(*b*) Canals.
(*c*) Water-supply to towns.
(*d*) The drainage of towns and districts, &c., &c.
(*e*) Canal administration.
(*f*) Accounts.

4. The technical knowledge which will enable an Engineer to carry out to completion from their first conception all works and details included in the above-mentioned classes must embrace—

1st.—A thorough knowledge of the operations of Engineering which depend upon geometrical principles, and which are comprehended under the general name of Engineering geodesy or field and office work, and which include—

(*a*) The use of the principal instruments employed in surveying and levelling operations.
(*b*) Surveying with the chain.
(*c*) Surveying by angular measurements.
(*d*) Levelling.
(*e*) Plotting surveys and levels, &c., computations, and the preparation of estimates, &c.
(*f*) Measurement of earthwork and areas of land.
(*g*) "Setting out works," including tunnels, curves, &c.

2ndly.—The Engineer must understand thoroughly the nature, properties and use of the various materials used in Engineering works, such as earth, stones, timber and iron; and the art of designing and forming the materials into structures of different kinds, such as

excavations, embankments, bridges, aqueducts, culverts, dams of masonry or earth, service reservoirs, systems of pumping arrangements, pipe systems for water-supply and drainage works; houses and buildings of various kinds;—in fact, all the many details and minor works which are obviously included in the various classes enumerated in paragraph 3.

3rdly.—The Engineer must understand thoroughly the principles according to which the structures just detailed are combined into more or less extensive projects, such as those detailed in paragraph 3, and to which might be added roads, railways, river improvements, sea defences, harbour works and architectural works, all or any of which the Engineer employed in the Public Works Department is expected to be competent to take up whenever called upon to do so.

4thly.—Canal administration.

This includes a knowledge of the general management of canal works, arrangements for the repairs of the various masonry and earth-works, canal clearances, &c.

The registration of rain and river and canal gauges, and the measurements of the discharge of streams and rivers, &c.

Some knowledge is required of the various crops grown and irrigated in the district through which the canal flows; the seasons in which they are sown and reaped, &c.

The Engineer must understand the system of measurements of crops, and the various registers and forms maintained in connection with the irrigation of crops.

He ought also to have a fair knowledge of the provisions of the Canal Act, and rules framed under the Act.

5thly.—Accounts.

An Engineer must have some knowledge of book-keeping in general, as well as a particular acquaintance with the accounts kept in the Executive Engineer's office, and which include cash, stock, works, transfers, deposits, refunds, salaries, &c., accounts, and over which, by the provisions of the Public Works Code, he is required to exercise "a real and efficient check."

5. The technical requirements of the General Branch are practically similar to those just detailed, except that they are perhaps not so varied, as they do not in general deal with the special subjects of irrigation and water-supply works, but are directed more to the arrangement, design, and construction of roads and buildings.

6. In considering the second part of this question, that regarding the professional attainments necessary for efficient service in this Department, it will be evident from the reply to the first part how very varied these qualifications must be, and it may at once be said that the Engineer must, in the first place, have had a good liberal or general education; if he has had the advantage of a university career, so much the better; in any case, a knowledge of mathematics is essential, is indeed almost the first essential for the student of Engineering; he should be acquainted with such physical sciences as bear on his profession, and should be familiar with the operations and processes necessary to apply their principles in practice.

This may be termed the theoretical education of the Engineer.

Secondly, he must be acquainted, by actual experience, with the nature of practical works, and with the operations and processes necessary for their design and construction. This may be termed his practical education.

7. It is essential to distinguish clearly between these two kinds of education, and there is probably little doubt but that young Engineers are not always prepared by preliminary education as well as they might be for this subsequent acquisition of practical knowledge.

It is not because there are not institutions where such knowledge can be obtained, but rather from a general laxity in the views of parents and guardians upon technical education, and probably sometimes from a conservative adherence to a system of training by apprenticeship, which was the only training that some of our greatest men have had, such as Smeaton, Brindley, Telford, and others; but it is obviously no argument to say "because I was imperfectly trained and yet have succeeded, therefore I will train my son imperfectly," and yet in Engineering it is said by some, and is practically acted upon by a greater number.

8. It would probably exceed the limits of what is required of me were I to go into a description of the course of study that ought to be pursued, but I may say that the course adopted at King's College, London, is an excellent preliminary or theoretical course; it consists of mathematics, natural philosophy in its various branches, including practical and experimental physics, the art of construction in connection with Civil Engineering and architecture, manufacturing art and machinery, land surveying and levelling, drawing, chemistry, geology and mineralogy, and photography.

This establishment, and others which are not devoted to special subjects, profess the education they give to be merely preliminary to the practical knowledge which can only be acquired by actual work.

9. The course of study at Cooper's Hill College is also very complete as a theoretical education, but the time spent on actual work is not, I think, long enough to qualify the students for the work which is expected of them. Further, I think it a mistake that Cooper's Hill students should be allowed to spend their year of practice on works in India; it should be compulsory that this year should be spent on properly-selected works in England.

10. Workshops or Engineering laboratories are now attached to most of the best Engineering Colleges in England, and this is most important with a view to affording the technical instruction necessary for the young Civil Engineer.

Technical knowledge acquired in the workshops enables the young Engineer to recognise the quality of materials, to prevent his mistaking one material for another, and to be the better judge of its use and value.

He would learn where and how to look for faults in materials, and would have a better idea of designing iron and wood work, &c. For example, without such knowledge he might easily design something which it would be impossible to cast or to forge, or might arrange it of such a form as to make it cost much more than it would have done had he some experimental knowledge of the moulder's art.

By actually handling and working on different materials, he would become much better informed as to their peculiarities and their adaptability to various kinds of work.

By working with machine tools he would become familiar with many contrivances and methods in machine construction, which could not fail to be of service to him. In India it often happens that the Civil Engineer is far from the assistance of the Mechanical Engineer, and the technical knowledge gained in the workshops would make him feel less helpless, and he would be less likely to fritter away time and money, than a man who only knew something of machinery and materials from books, or from hastily-paid visits to factories.

11. Again, technical instruction in the case of the Civil Engineers must be gained in other subjects as well, and to become a useful practical Engineer he must take every opportunity of perfecting himself in surveying and levelling, and in the methods employed in the setting out of works; learn the use and applications of tools; he must be able to distinguish a good material from a bad material, good workmanship from bad workmanship, sound ground from treacherous ground, good puddle from bad puddle, good mortar from bad mortar, a good workman from a bad workman, and should make himself acquainted with every description of plant and all the appliances which an experienced contractor employs for the purpose of rendering a paper design into a substantial structure.

12. Again, as regards office work and the study of drawing, it is impossible for an Engineer to be too ready or too accurate in the case of his pencil, and the study of drawing, including the various systems of projection and geometrical drawing, should be maintained throughout the whole course of his training. Office work, including estimating and computations regarding the strength of materials, hydraulic computations, &c., should form a more important part of a collegiate or educational course than it now occupies, as young Engineers on joining this Department are much more useful, if proficient in this kind of work, which is often more or less neglected for the higher duties of the profession, such as designing large works, &c., which he is not called upon to perform until experience has taught and proved his capabilities.

13. Finally, I would express it as my opinion that if Government desire to have the best class of Engineers, the education of candidates for the Engineering or Officers' establishment of this Department should be undertaken in England, and should include a practical course on actual works in England of at least one full year, or, better still, two years. I do not wish to underrate the gain of a knowledge of the ways, habits and manners of the people of this country, and of their language, but surely a thorough knowlege of one's profession is the first requirement for efficient service, and in no country are the opportunities for practical education so great or so varied as they are in England. If, therefore, Government desire to have the best Engineers possible, they must, in my opinion, only take men, no matter what their nationality may be, who have been educated in England, and they must not limit the educational institutions upon which they draw to one, but should select other well-known colleges, and foster a healthy competition between those institutions.

Having obtained appointments by competition, the successful candidates should pass one, or, better still, two years on actual works of construction, one of which might be in workshops, when they would be ready and fit to take up appointments in the Public Works of India with credit to themselves and advantage to the country.

1. *Question No. 4.*—Regarding the classes of the community who seek to be employed in this Department, I will divide them as follows:—

(*a*) Europeans educated and brought up in England.
(*b*) Europeans educated and brought up in India.
(*c*) Eurasians.
(*d*) Natives of India.

2. My experience has been chiefly confined to classes *a* and *d*, but I have also had some little experience of classes *b* and *c*. The Assistant Engineers who served under me have included gentlemen from Cooper's Hill and Roorkee Colleges and others, and, on the whole, I prefer those from Cooper's Hill College to any others I have had to do with.

3. I have had a great deal of experience of Natives in the subordinate establishment, and in this position prefer them to any other class for the particular kind of work appertaining to the Irrigation Department.

4. I may here say that during my service in this country, I have been almost entirely employed in the Irrigation Department, and I know that the duties of subordinates require a large amount of sympathy with the large class of Native cultivators with whom they are brought in contact; it is desirable that they should mix with and reside amongst them; and intimate knowledge of the

Native language is absolutely necessary, as well as an acquaintance with the manners and customs of the Natives, so as to more fully and readily understand their wants and requirements, their grievances, &c., &c.

5. In surveying and levelling operations Natives are quite equal to Europeans.

6. In the Accounts Branch, as Accountants Natives are quite equal to Europeans.

7. In the actual construction of works Natives do exceedingly well in subordinate positions.

8. Where they fail is in emergencies and under sense of responsibilities; also, comparatively speaking, in want of energy and endurance. I consider Natives to be wanting in self-reliance; they are afraid of the heavy responsibilities which most irrigation officers in charge of districts, or even of subdivisions, have frequently and constantly to undertake; they are not as energetic physically as Europeans, nor are their powers of endurance as great.

My experience therefore leads me to think that while Natives are well suited for the subordinate establishment, they are not by any means as well fitted for the Engineering or Officers' establishment as Europeans educated and brought up in England; but should Government desire to employ educated Natives in this capacity, it ought to be a *sine qua non* that they should receive their training in England.

No. VIII.—Note by PANDURANG RAMCHANDRA DESAI, ESQ., Pleader in the District Court at Thana.

P. R. Desai, Esq.

Before I became a Pleader I had been in Government service for several years, partly in the Public Works Department in Bombay, and partly in the Collector's office at Satara, both in the Correspondence and in the Account Departments. I was one of the witnesses examined by the Public Service Commission in Bombay last cold season. The point on which I wish to tender my evidence is that Native Head Accountants, Mamlatdars who had been Head Accountants, and officers in charge of Collectors' huzur treasuries, ought to be, as a rule, promoted to appointments now held by Europeans in the Accountant General's office. I may venture to say that it is an admitted fact that Natives are very clever, accurate, and quick in accounts. It is the Natives who make up in the most satisfactory and efficient manner the bi-monthly accounts with their numerous appendices for the most punctual despatch to the Accountant General from the bulk of the daily sheets sent up by Mamlatdars and other officers in charge of taluka treasuries. Even in the Accountant General's office the most intricate and tedious duties relating to the preparation of accounts, &c., for transmission to the higher authorities, are mostly done by Natives. Few Europeans can equal, much less can they surpass, Natives in this respect. Young civilians, on their arrival in this country, are often attached to huzur treasuries, generally in charge of Native officers, to enable them to pick up, with the aid and advice and under the guidance of the treasury officers, technical knowledge of the system followed in the Collector's Account Department. It may be said (though under correction) that it is some of these civilians who, when promoted to higher appointments in the Accountant General's office, scrutinize, audit, and pass the accounts submitted by the Native officers from whose very aid and advice and under whose very guidance they have largely benefited themselves in acquiring knowledge of the system followed in the mufasal huzur treasuries. It must, therefore, be admitted that the Native officers who have honestly, efficiently and faithfully served Government in their Account Department for *years*, and who are able to *teach others* all that is required for the efficient discharge of the duties pertaining to account matters, have, beyond any reasonable dispute, very strong claims upon appointments of higher emoluments in the Accountant General's office, which appointments are now mostly held by Europeans and Eurasians. I may, perhaps, be allowed to go the length of saying here that a Native of *proved* merits, abilities, and sound education ought to be promoted even to the office of the Accountant General. Some may argue that it is inadvisable to appoint a Native, however qualified in other respects, to such a high post, alleging that this circumstance will give rise to misunderstanding and constant friction between such an officer and other European officers of Government coming in contact with him. This argument is, in my opinion, hardly sustainable. The Accountant General has, as a Magistrate, the Penal and the other Codes, a printed Code. In it are contained simple, clear and definite rules relating to the questions of leave, pensions, gratuities, salaries and allowances due to officers on promotion, budget estimates, and other matters concerning finance with which this officer has to deal and to advise Government and other officers of State. A Native Accountant General has, in case of any misunderstanding and friction, simply to refer the disputing party to this Code as any other European officer holding this appointment would naturally do for the final settlement of questions forming the subject of misunderstanding and friction. This latter course is, as far as my own information goes, always followed by Native officers in charge of large huzur treasuries in places like Poona, Ahmedabad, &c., where there are numerous civil and military officers, whenever occasions for so doing arise, and matters are carried on as smoothly as they are carried on in Bombay and elsewhere, where the Accountant General's office is presided over by a European.

In conclusion, I would respectfully take this opportunity of pointing out to Government that this is one of the several ways for bettering the prospects of the Native members of the Uncovenanted Civil Service, who are indisputably men of proved merit and abilities, and who have served a lifetime the State, and whose circumstances in life have already rendered them unfit, to a certain extent, for employment in other departments.

Government of India Central Printing Office.—No. 16 P. S. Com.—15-2-88.—525.